final master plan

april 1976

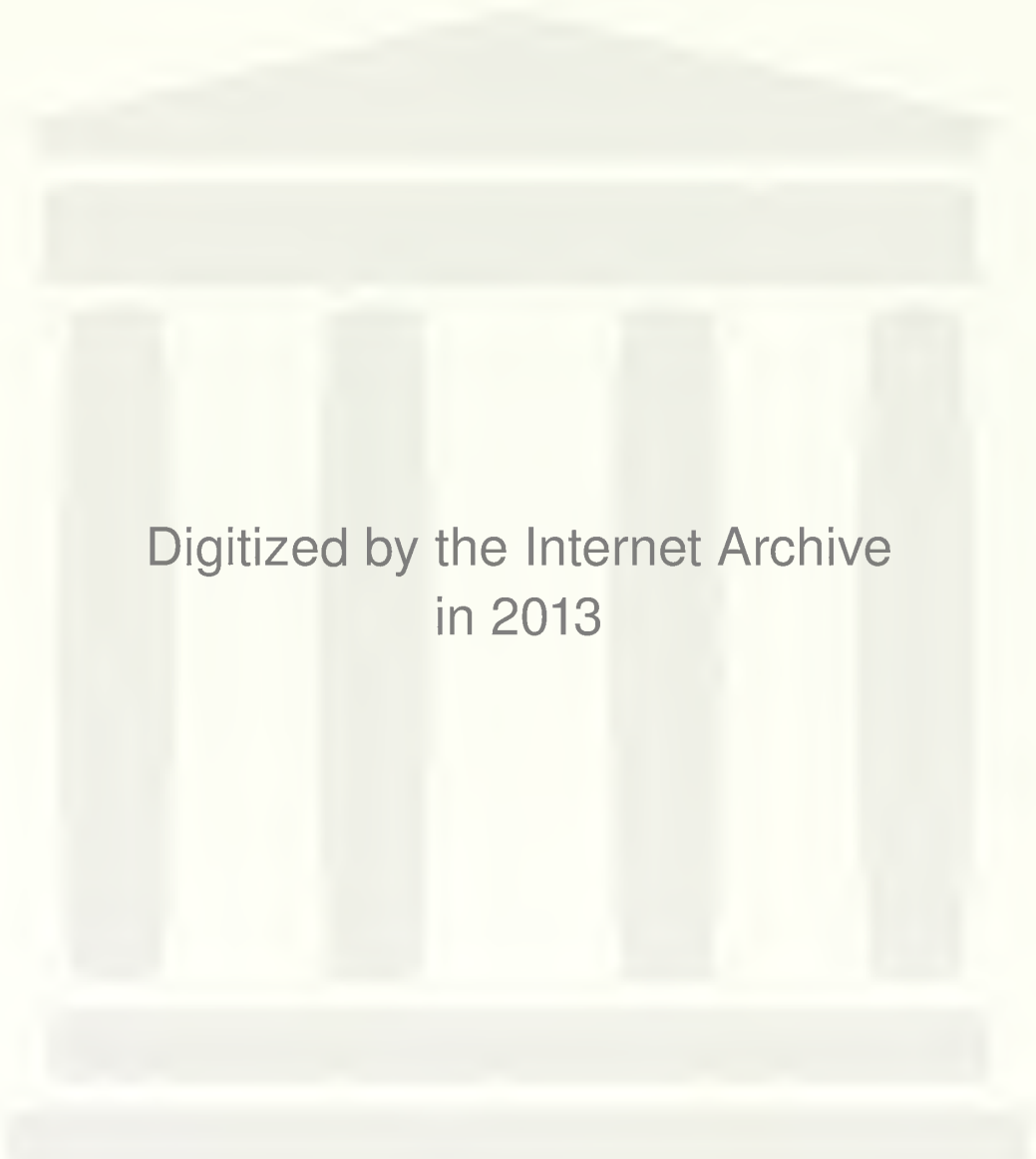
MAMMOTH CAVE

NATIONAL PARK / KENTUCKY

United States Department of the Interior / National Park Service

final master plan

Mammoth Cave National Park



CONTENTS

INTRODUCTION

PURPOSE OF THIS REPORT

The National Park Service is charged by the Congress (Act of May 25, 1926: 44 Stat. 635) with the responsibility to manage, develop, interpret, and preserve Mammoth Cave National Park "for the benefit and enjoyment of the people."

In recent years, increasing travel to the park, changing public needs, and studies required by the Wilderness Act have necessitated a complete review of the park's development and management.

This new master plan recognizes the relationship of the park to the surrounding region and provides for the continuing enjoyment of the park by the visiting public, yet preserves its basic values.

MANAGEMENT OBJECTIVES

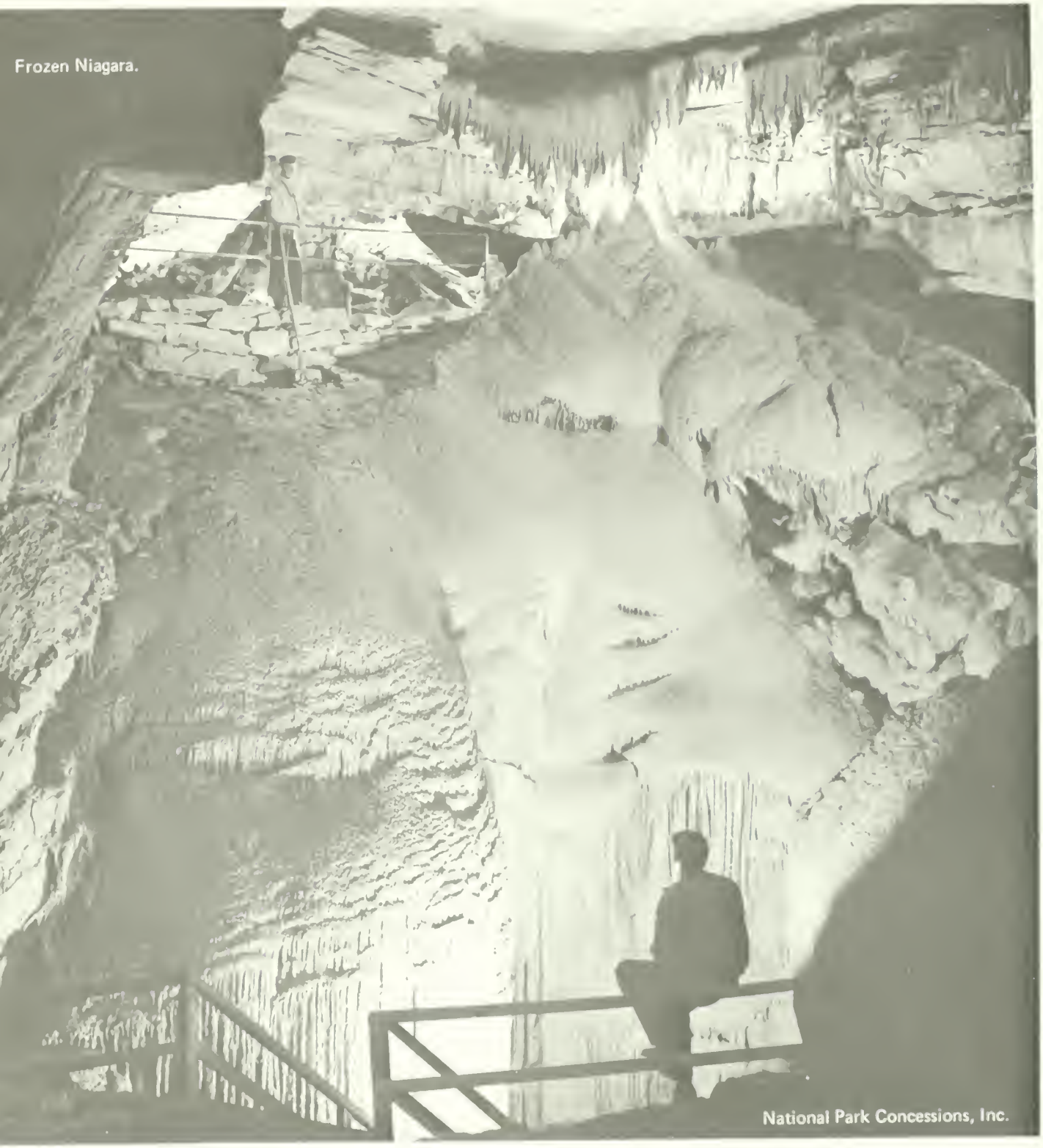
The aim of management at Mammoth Cave National Park is to perpetuate the integrity and diversity of geologic features and life systems that are associated with the caves, and the aquatic and terrestrial environments, for these have aesthetic, recreational, educational, and scientific values to man. The management objectives for the park are as follows:

General Management

To work with local, state, and federal agencies for the enactment of regulations or the development of agreements that will protect the park's natural and historic resources and scenic values from intrusive developments or noncompatible uses of adjacent lands.

To obtain sufficient staff and funds so that contacts can be maintained with individuals, organizations, and other agencies in adjacent communities, and throughout the state as necessary for the fulfillment of the park's objectives and the missions of the Park Service.

To reduce the impacts on areas that contain fragile natural resources by relocating, where necessary, the developments and facilities for administration, maintenance, visitor service, and the Civilian Conservation



Frozen Niagara.

National Park Concessions, Inc.

Corps to areas, which are able to support such use without sustaining unacceptable environmental effects.

To ensure that all new developments are restricted to sites that can support such use and that the design and construction of all new facilities and the provision of water, power, waste disposal, and communication services will not adversely affect the scenic values or have unacceptable impacts upon the ecosystems, the natural resources, or the historic or prehistoric resources.

To encourage private enterprise to develop camping facilities within reasonable distances of the park.

To provide a public transit system that will eliminate congestion created by privately operated vehicles, and that will supply efficient and comfortable transportation for park visitors.

To petition the Western District Court of the United States of America in Kentucky to modify its order on intrapark roads to permit a public transit system to operate freely and allow the elimination of nonessential roads not providing access to cemeteries or churches.

To resolve problems relating to easements or other reserved rights of record.

To negotiate with the Commonwealth of Kentucky to acquire concurrent jurisdiction over all lands now or hereafter included within the boundaries of the park.

Resources Management

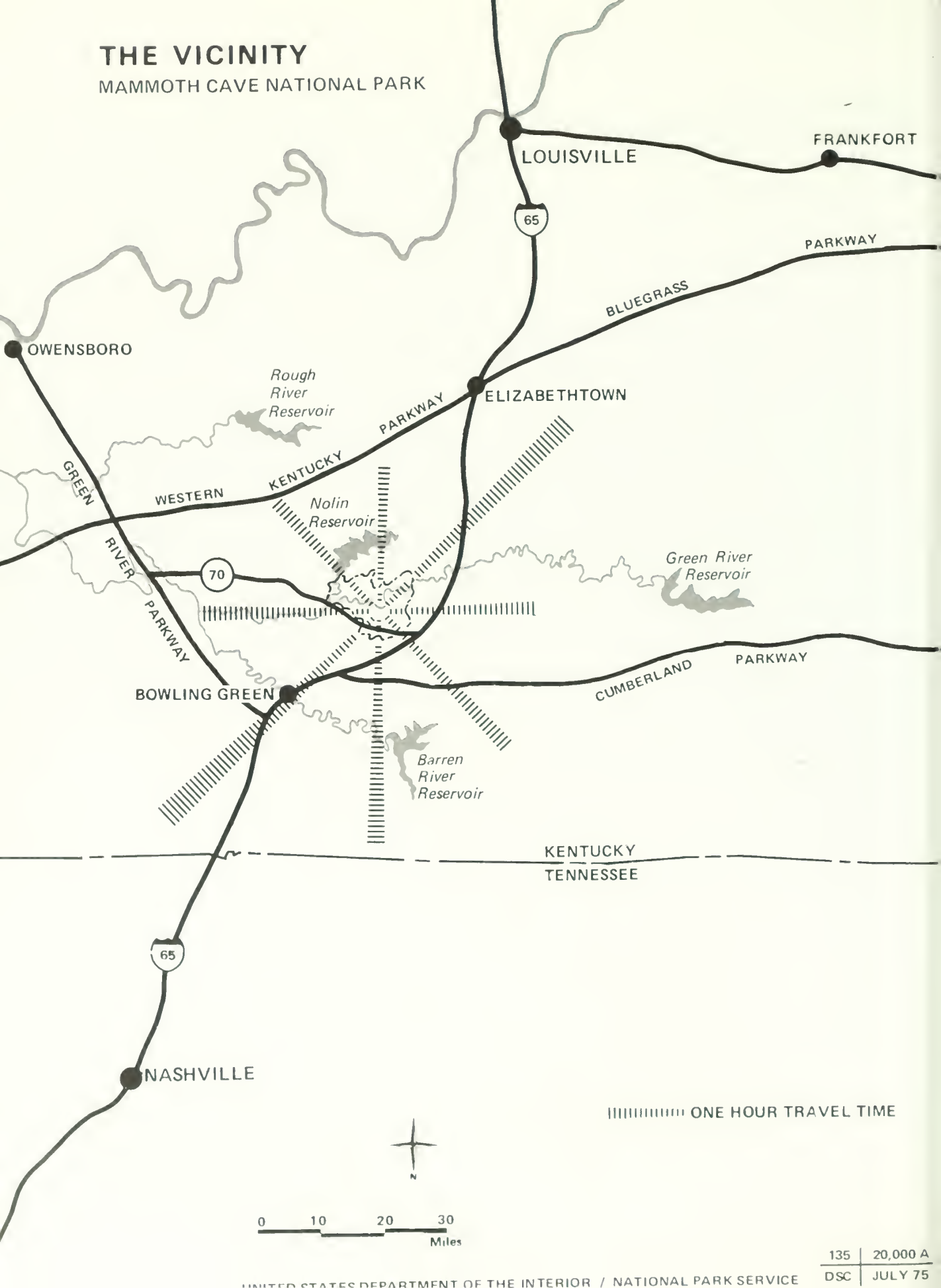
To institute research to obtain the information necessary for the management and interpretation of the park resources, to ensure that all developments are compatible with the natural, historic, and prehistoric resources, and to ensure that use will be limited to the capacity of the resources to absorb it.

To preserve unique surface features and lesser-used caves pending the acquisition of scientific or otherwise competent knowledge that will define acceptable parameters of use and preservation.

Visitor Use

To provide within the park only those public-use facilities and services essential to visiting the caves and other natural and historic features of the park.

To increase the number, type, and quality of interpretive trips and programs provided within the park.



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To control visitor use as necessary to protect the park visitor, to preserve the natural and historic resources, and to ensure that meaningful interpretive services can be provided.

To disseminate environmentally related scientific information to the park visitors and to those within the park's sphere of influence.

To establish a reservation system for educational and scientific groups and to encourage such groups to schedule their visits during periods of light use.

To develop new entrances to the cave system where feasible and needed.

SUMMARY OF THE PLAN

The Region

The "Cave Country" of south-central Kentucky, which relied for years on agriculture, has now turned to light industry and tourism for its major income sources. Access to the region is primarily by way of the Louisville-Nashville corridor, a north/south route, containing two major highways and a railroad, all to the east of the park. Population and tourist accommodations have concentrated along this corridor. Interstate Highway 65, completed in this corridor in 1969, further stimulated construction of new motels, campgrounds, service stations, and other related tourist-oriented developments and services. Several state resort parks and summer homesites are being developed on the shore of reservoirs in the region. "Cave Country" is caught up in the general expansion of our outdoor-recreation minded economy and this is causing sweeping changes in the region. Mammoth Cave continues to draw ever-increasing numbers of visitors – an average increase of 30,000 per year from 1960 to 1974.

Improvement in transportation and increase in accommodations outside the park have drastically altered visitor patterns in the park. In the past, Mammoth Cave was a vacation destination; now 75 percent of the visitors remain in the park only 4 hours or less – long enough to enjoy a cave trip and relax while en route somewhere else.

Development of areas adjacent to the park can have profound effects on the park's resources. Particularly critical is the Sinkhole Plain to the south and east of the park. This 100,000-acre area is a natural "catchbasin" for rainfall that collects in underground streams, flows through natural conduits in limestone beneath the park, and discharges into the Green River. Even minor changes in quantity or quality of this water could adversely affect unique aquatic life in these streams and could cause park caves to be closed. In 1944, the stream in Hidden River Cave in the town of Horse Cave near the park, became polluted by sewage; the cave has been closed to public tours

ever since. The National Park Service solicits the aid of county and Commonwealth governments to ensure that the Sinkhole Plain remains in agriculture. Development along and near the park's south and east boundaries could also contaminate underground streams unless solid and liquid wastes are treated properly.

The Plan for The Park

In establishing Mammoth Cave National Park, the Congress noted three distinctive features of national significance:

Extensive limestone caverns and associated topography

Beautiful rivers

Rugged landscapes clothed in forests

The area containing these features was approximately 70,618 acres in extent and it offered "exceptional opportunity for developing a great national recreational park of outstanding service in the very heart of our Nation's densest population and at a time when the need is increasingly urgent and most inadequately provided for." These words are as applicable in 1976 as they were when they were written in 1926!

Today the park comprises only 51,354 acres purchased by a combination of private and public funds and donations.

Based on the aforementioned features, the park has been divided for convenience of reference in this plan to three zones for management and use: the Mammoth Cave Plateau, the River Valleys, and the Hilly Country.

Traditionally, the great majority of visitors have come to the park only to see Mammoth Cave. This has caused concentration of visitors and facilities on Mammoth Cave Ridge. An intolerable congestion of cars and visitors occurs at Historic Entrance throughout the summer season and on peak travel days in spring and fall. While this plan seeks to diversify park use so that visitors will have an opportunity to see more of the park, congestion will continue to increase at Historic Entrance unless a bold new scheme of visitor use is adopted.

This plan proposes relocating essential visitor facilities from Historic Entrance to a peripheral staging area where visitors' cars will be parked near an information/orientation center. From there a public conveyance will carry visitors to points of major interest. This will allow more people to visit

ZONES FOR MANAGEMENT AND USE
MAMMOTH CAVE NATIONAL PARK

MAMMOTH CAVE PLATEAU

HILLY COUNTRY

RIVER VALLEYS

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the caves and related features, and will improve the quality of the individual visitor's experience. This will also be accomplished by establishing the optimum number of persons participating in each cave trip, and interpretation will be improved.

This plan also recognizes the need for cave-oriented research and exploration and suggests methods for implementing such a program. A cave zoning system is recommended to guide the management of subterranean resources.

Access to the Green and Nolin Rivers for boating, fishing, primitive camping, and for a sightseeing boat trip will be improved. Travel by hand-propelled or by low-powered, motor-propelled boats will provide rich experiences for observing and enjoying wildlife.

The Hilly Country zone is west of Turnhole Bend and north of the Green River. There are no extensive cave systems beneath it, but this zone contains significant forest resources, fine scenery, and abundant opportunity for hiking and nature study. There are also excellent opportunities to observe and to teach some of the relationships between man and his environment. Several rare and relatively undisturbed ecosystems have been located, which require special protection so their value as scientific reserves may be realized. Two small ferries cross the Green River in the park. They handle light traffic now, but they are inadequate for increasing traffic expected in the near future.

To make the Hilly Country more accessible and to facilitate required transpark traffic, it is recommended that a bridge be built across Green River at Houchins Ferry and that the Houchins Ferry Road be upgraded.

From this roadway, access could be provided by foot or by horseback to scenic attractions like Buffalo Creek, Nolin River, and First Creek Lake. The existing Houchins Ferry Road would continue to provide access to picnic and boat launching facilities on the riverbanks. The ferry might continue as a bit of "living history."

Fulfillment of this plan will require more than a decade to carry out. Then the visitor to Mammoth Cave National Park will be able to use and enjoy its natural resources more fully than ever before. While Mammoth Cave will continue to receive the greatest intensity of visitor use, other cave systems offer resources for important scientific research. In turn, the irreplaceable and unique resources of the cave systems will receive better protection. The plan also provides opportunities for visitors to become better acquainted with the scenery of the river valleys and the northern portion of the park.

THE VISITORS

WHERE DO THEY COME FROM?

A recent survey shows that 71 percent of the park's visitors originate within Kentucky and the four heavily industrialized and urbanized states to the north. This is the "Travel Influence Area" shown on the accompanying map.

Higher population densities and higher median incomes may account for the imbalance of northern visitation. Moreover, some of this northern population migrated from Kentucky and Tennessee and many of them return to their homes to spend their vacation time. Visitors are also attracted to central Kentucky and Tennessee because of large reservoirs and mountains not available to the north.

The 8-hour travel line shown on the map indicates one day's average travel time from the park. Most major metropolitan areas to the north are at such a distance from south-central Kentucky that visitors require overnight accommodations. Completion of the Interstate Highway System will provide an expanded time-distance line, but most travelers will still be a day's drive, or more, from the park.

The north/south travel corridor was established early in the 19th century with the construction of the Dixie Highway (now U.S. Highway 31W). This

RELATIONSHIP OF VISITOR SERVICE AREA TO OTHER STUDY AREAS

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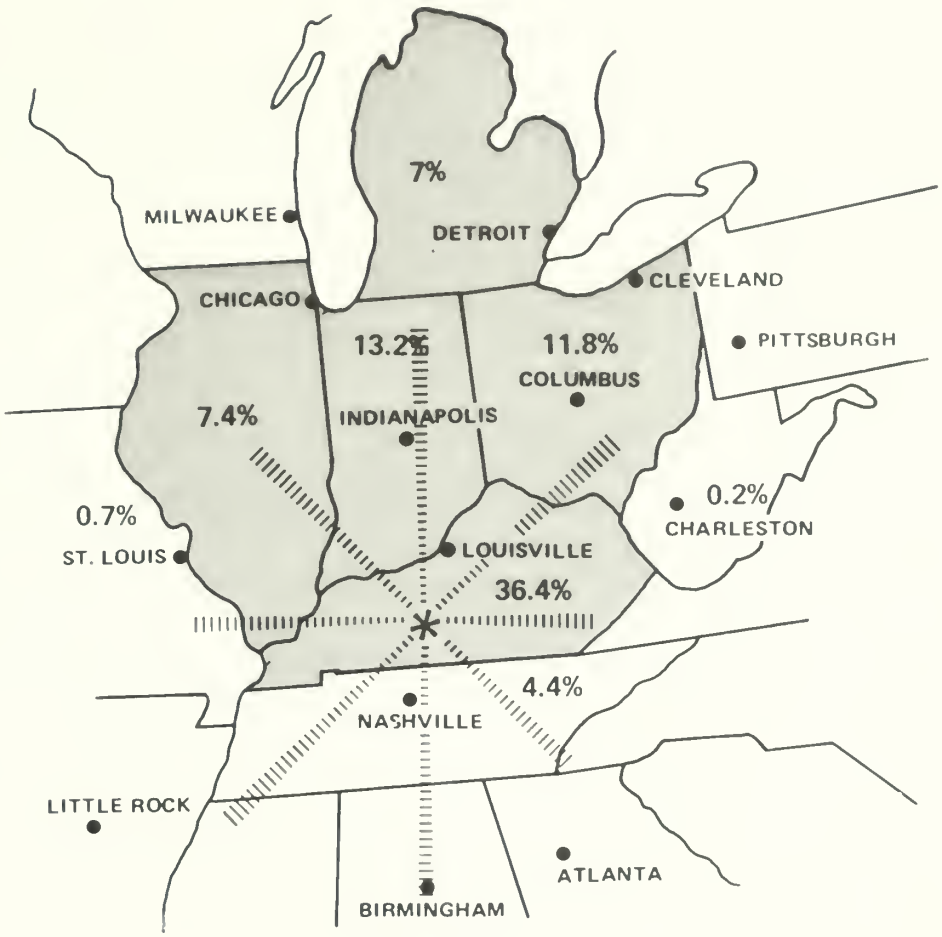

POPULATION OF STANDARD METROPOLITAN STATISTICAL AREAS (1970)

Akron, Ohio	679,239	Greenville, S. C.	299,502
Atlanta, Ga.	1,390,164	Indianapolis, Ind.	1,109,882
Birmingham, Ala.	739,274	Knoxville, Tenn.	400,337
Charlotte, N. C.	409,370	Little Rock, Ark.	323,296
Chattanooga, Tenn.	304,927	Louisville, Ky.	826,553
Chicago, Ill.	6,978,947	Madison, Wis.	290,272
Cincinnati, Ohio	1,384,851	Memphis, Tenn.	770,120
Cleveland, Ohio	2,064,194	Milwaukee, Wis.	1,403,688
Columbus, Ohio	916,228	Nashville, Tenn.	541,108
Davenport, Ia.	362,638	Peoria, Ill.	341,979
Dayton, Ohio	850,266	Pittsburgh, Pa.	2,401,245
Detroit, Mich.	4,199,931	St. Louis, Mo.	2,363,017
Grand Rapids, Mich.	539,225	Toledo, Ohio	692,571

TRAVEL INFLUENCE AREA

DISTANCE FOR 8 HOUR TRAVEL

% VISITATION FROM STATE

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NATIONAL PARK

UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE

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DSC	JULY 75

has been upgraded continually over the years and is now paralleled by Interstate Route 65 from Chicago to Mobile. The Louisville and Nashville Railroad, built in the mid-19th century, also traverses this corridor.

VISITOR SERVICE AREA

The caves of "Cave Country," the north/south travel corridor, state parks, two Corps of Engineers' reservoirs, and the national park have resulted in a concentration of visitor services within an hour's drive of park headquarters.

Since the early 1940s, when Mammoth Cave gained recognition as a national park, the tourist industry has expanded to meet visitor demands. The 1966 Copeland Travel Survey of Kentucky disclosed that one-third of the retail business firms in "Cave Country," employing 4,057 persons, had receipts of $53 million, $15 million of which was spent by tourists from other states. The $53 million ranked tourism third, as an economic unit, behind manufacturing ($67 million) and agriculture ($84 million).

Much of this tourism industry is clustered around the main access routes to Mammoth Cave National Park, in the towns of Cave City and Park City, where there are numerous motels, campgrounds, and visitor attractions. Most of these facilities were constructed between 1966 and 1971 and were generated by increasing travel to the park during the 1960s and promise of better access provided by the Interstate Highway System.

Another impact of the park on the region has been the shortening of time people stay in the park. Years ago, most visitors stayed overnight; now the average visitor spends 3 to 4 hours. Within the Visitor Service Area, private enterprise is upgrading its attractions and accommodations and encouraging visitors to stay longer in "Cave Country."

The Visitor Service Area does not add significantly to the park's visitation. Population density is low (48 persons per square mile) and has remained stable for the past 20 years. Only 25 percent of the population is considered urban and no significant increase in urbanization is expected before 1980.

The Visitor Service Area mostly lies within the newly formed Barren River Area Development District (BRADD), which was established by the

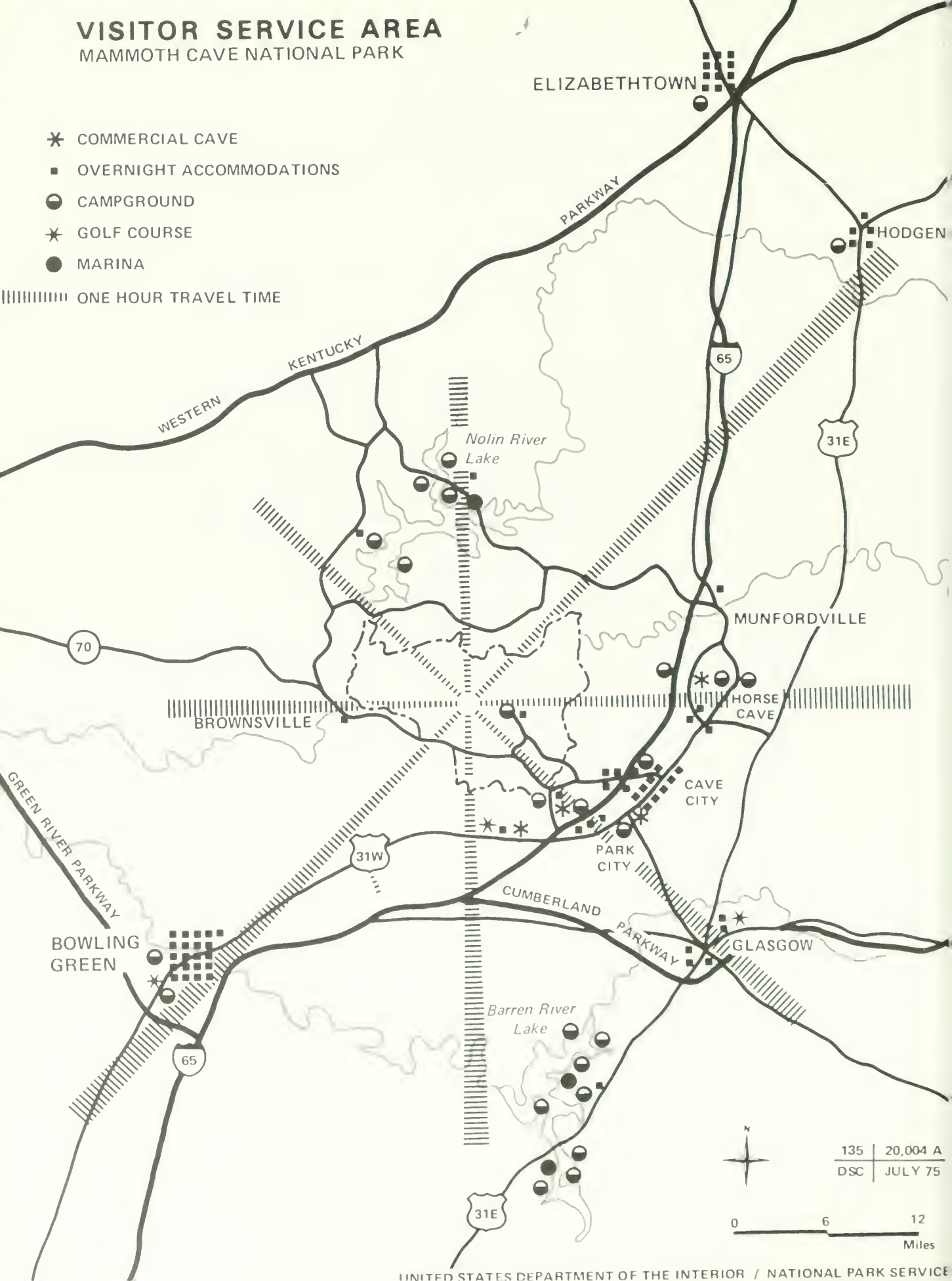
Commonwealth in cooperation with the Economic Development Administration of the U.S. Department of Commerce. The purpose of the district is to upgrade the economy of the area by securing funds for specific development projects. This district contains 10 counties surrounding the park. Under state enabling legislation, a council is responsible for planning land use and public facilities. A planning staff has been hired and local support for the council appears to be strong. This council provides an excellent vehicle for joint regional planning and the National Park Service is represented on it.

Within the Visitor Service Area are three fast-growing cities — Elizabethtown, Glasgow, and Bowling Green — and Nolin River and Barren River Lakes constructed by the Corps of Engineers. On both reservoirs are boat ramps, marinas, and campgrounds, and a state resort park is being developed by the Commonwealth on Barren River Lake. The resort park will consist of a full range of overnight accommodations, golf course, swimming pools, marinas, and other amenities designed to cater to the out-of-state traveler. Just outside the Visitor Service Area, similar resort park developments are underway on the Rough River and Green River Lakes. Much of the private land surrounding each of the reservoirs is being sold for vacation homesites, which will add another dimension to the regional economy.

The Corps of Engineers has invested $960,000 in recreational development on the Nolin River and Barren River Lakes since 1960, and expects to double the capacity of most of these facilities in the near future because of heavy visitation.

In 1969, there were 58 motels providing 2,300 units (average unit, two double beds) and 25 campgrounds providing 7,633 campsites within the Visitor Service Area. Many of these are situated on the established north/south travel corridor, which facilitates their use by the through traveler. Occupancy rates for the motels and private campgrounds are not available.

Within 1/2 hour from the park, there are six, small privately owned commercial caves that generally feature dripstone and flowstone formations on 1-hour guided tours that seldom exceed 25 people in a group. Commercial caves usually remain open in the late afternoon after the park caves are closed and some provide evening tours. All caves are open


VISITOR SERVICE AREA
MAMMOTH CAVE NATIONAL PARK
COMMERCIAL CAVE
OVERNIGHT ACCOMMODATIONS
CAMPGROUND
GOLF COURSE
MARINA
ONE HOUR TRAVEL TIME
ELIZABETHTOWN
HODGEN
PARKWAY
WESTERN KENTUCKY
65
31E
Nolin River Lake
MUNFORDVILLE
70
HORSE CAVE
BROWNSVILLE
CAVE CITY
PARK CITY
GREEN RIVER PARKWAY
31W
CUMBERLAND PARKWAY
GLASGOW
BOWLING GREEN
Barren River Lake
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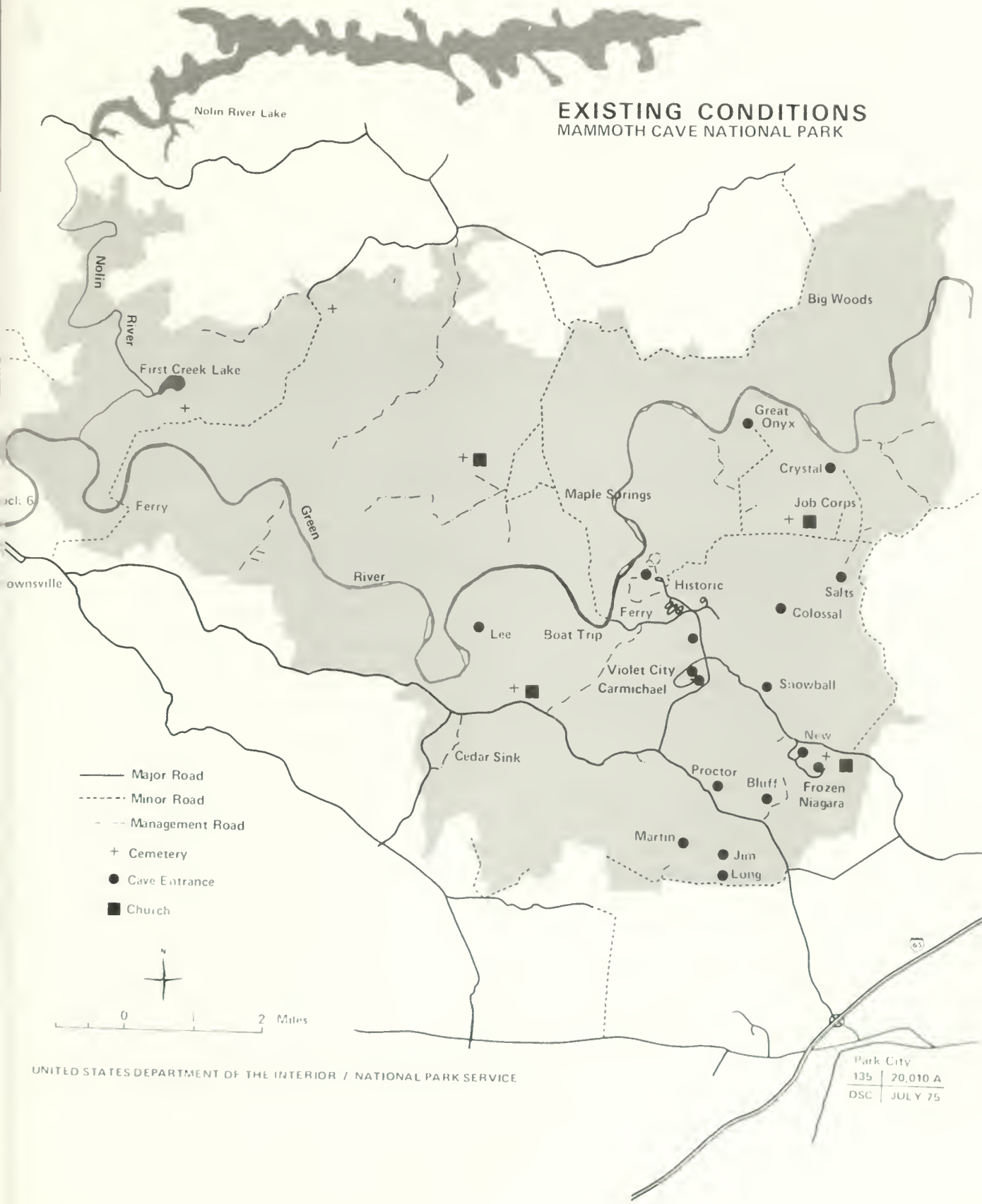
EXISTING CONDITIONS
MAMMOTH CAVE NATIONAL PARK
Nolin River Lake
Nolin River
First Creek Lake
Ferry
Green River
Big Woods
Great Onyx
Crystal
Job Corps
Maple Springs
Historic Ferry
Salts
Colossal
Lee
Boat Trip
Violet City
Carmichael
Snowball
New
Frozen Niagara
Cedar Sink
Proctor
Bluff
Martin
Jim
Long
Major Road
Minor Road
Management Road
Cemetery
Cave Entrance
Church
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UNITED STATES DEPARTMENT OF THE INTERIOR / NATIONAL PARK SERVICE
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DSC | JULY 75

throughout the year. Colored lights illuminating the dripstone and flowstone formations produce an artificial appearance, but it is generally done in good taste and provides a contrast to the white light used in Mammoth Cave. Interpretation in commercial caves is generally limited to the personification of the formations by the guide. Nevertheless, the visitor has a unique and somewhat mystical experience, which is a good contrast to cave trips in the park.

Other tourist attractions in the Visitor Service Area include the Abraham Lincoln Birthplace National Historic Site, and Western Kentucky University. Affording somewhat unique experiences for visitors are the oil fields in Green County and tobacco auctions during December and January (there are 25 tobacco warehouses in the area). Outside of the 1-hour travel time, but close enough to be considered attractions, are My Old Kentucky Home State Park at Bardstown, the 10,000-acre Bernheim Forest and Arboretum northwest of Bardstown, and the reconstructed Shaker Village in Auburn.

Other influences of the region on the park come in the form of state and Federal projects:

Mammoth Cave Parkway Two miles of Kentucky 255 from the park boundary to its interchange with I-65 were reconstructed by the Commonwealth in 1968. A 500-foot-wide right-of-way was purchased to maintain the scenic quality and access has been limited to three points, resulting in an attractive approach to the park. Projected traffic at the I 65 interchange is 15,000 average daily units by 1975.

Interstate Highway 65 Louisville and Nashville, with their 1.5 million people, were brought within 2 hours travel time of the park upon completion of I 65 in 1973. One-quarter of the U.S. population will live within 500 miles of the park when the Interstate Highway System is completed in the mid 1970s.

Green River and Cumberland Parkways These toll roads, opened in 1973, in combination with an upgraded Ky 70 have improved east/west circulation through southern Kentucky into "Cave Country" and have placed the Corps of Engineers' Green River and Rough River Lakes within 90 minutes travel time of the park. Nolin River and Barren River Lakes are much closer. Planned public-use facilities when completed around these four reservoirs will probably attract many tourists on a long-term basis. All told, there will

be 15,375 feet of bathing beaches that will accommodate 10,000 swimmers per day, three major state-operated resort parks, six marinas, numerous boat ramps to accommodate 3,700 boats per day, and 1,628 formal campsites. These new travel corridors will also have an enormous impact on counties such as Edmonson and visitor attractions such as the Nolin River Lake, which heretofore have been "off the beaten path." Kentucky has not programmed funds to upgrade Ky 70, because it is adequate for present traffic.

Green River This is one of the most outstanding features of Mammoth Cave National Park. Kentucky has been considering scenic protection for the Green River outside the park. The National Park Service would welcome this added protection and recognition.

EFFECTS OF REGIONAL DEVELOPMENT ON PARK PLANNING

It is apparent that the scale of current development in the region is intense and numerous existing and proposed facilities will combine to satisfy a substantial amount of the demand for visitor services. By maintaining a pleasant environment in "Cave Country," visitors will be encouraged to stay and enjoy its attractions. The Barren River Area Development District's year 2000 long-range plan, when adopted, will help in guiding the region toward both a quality environment and a strong economic structure by combining the tourism industry with a well-balanced mixture of nonseasonal industry.

Years ago the visitor to Mammoth Cave reached it after a long and tedious journey that required a rest period or vacation. At that time the cave was a destination and in most cases the sole purpose for the trip. During the past 25 years the tourist has become more mobile and the park is no longer an exclusive destination area. Moreover, the intensity and scope of development outside the park suggests that overnight accommodations may not be needed within Mammoth Cave National Park in the future. Then the park will fill a day-use need, and private interests in the Visitor Service Area would provide lodgings.

Also, since most visitors approach Mammoth Cave from the primary travel corridor east of the park, the point of departure for cave trips within the park should be mutually accessible to the cave and to the corridor. To meet these criteria, the point of departure, or staging area, should be located peripherally at the southeast corner of the park.

PARK RESOURCES AND THEIR USE

RESOURCES DESCRIBED

Mammoth Cave National Park is situated mostly in Edmonson County with small portions in Barren and Hart Counties. Within the park are the most extensive caverns and some of the finest examples of karst topography in the world, fascinating landscapes, luxuriant vegetation, an abundance of animal life, and artifacts illustrating the life of ancient people.

On the bluffs, coves, and steeper slopes throughout the park are beautiful groves of trees with little understory and a wealth of associated wildflowers. The park's checklist includes 84 species of trees, 28 kinds of shrubs and vines, 29 types of ferns, and 209 wildflowers.

Common mammals are deer, raccoon, opossum, grey squirrel, rabbit, woodchuck, muskrat, bat, and red fox. In all, 41 species have been observed. There are 203 species of birds, 18 kinds of reptiles including the timber rattlesnake and copperhead, which are poisonous, and 15 amphibians.

In the Rotunda, guides explain how saltpeter was mined in Mammoth Cave from 1809-19. NPS Phot

Three of the five physiographic divisions of the central Kentucky karst are represented in the park: Mammoth Cave Plateau, Green River Valley, and the Hilly Country. No part of the Dripping Spring Escarpment or the Sinkhole Plain is included within the present boundary.

The *Mammoth Cave Plateau* is that portion of the park south of Green River and eastward from Turnhole Bend. Beneath it over 150 miles of cave passages have been explored. The cave passages contain minerals such as dripstone, gypsum, and mirabilite; prehistoric Indian artifacts; fossils; and about 300 kinds of living animals and plants. The plateau is an erosional remnant consisting of three northwest trending ridges – Joppa, Mammoth Cave, and Flint – separated by solutional valleys 200-300 feet deep, formed when cave ceilings collapsed along the beds of ancient streams. Ridges are capped by an impermeable sandstone layer about 100 feet thick, which has protected the caves in the limestone beneath. In cross section, the limestone is honeycombed with passages. Solution of the limestone and flowing water have both contributed to the development of the cave passages, which vary in form from tubes to canyons and low-ceilinged crawlways. Some sections are up to a hundred feet in width and height and 400 feet long; other passages may constrict to cracks that allow only water and air to seep through.

Grand Central Station, familiar to many cave visitors.

-- NPS Photo.

Under Joppa Ridge near Elko, a major cave system of unknown extent was recently discovered. The National Park Service announced on December 1, 1972, that Cave Research Foundation explorers had found a connection between the caves underlying Mammoth Cave Ridge and Flint Ridge. These comprise the longest known linear cave system. A total of 144.4 miles had then been surveyed and there are other passages awaiting exploration. Switzerland's Holloch Hölle is the second longest cave in the world with 71.8 miles of passages known to date.

Most of the park's cave passages are dry, because of the sandstone caprock, yet the deepest passages are flooded by streams and lakes. There are domepits up to 200 feet in height carved by water that pours in from the surface in wet weather.

The 50 inches of annual rainfall goes underground quickly through cracks and crevices in rocks. Surface streams flow only during the rainy season and for short distances before disappearing in swallow-holes. There are many springs on Flint Ridge and their water flows into caves beneath.

Fauna of the caves comprise some 200 species. Those that spend their entire lifetime in the cave (troglobites) have remained isolated from others of their kind for about a million years. They thrive in an environment of total darkness, high humidity, and at a constant temperature of 54 degrees F. Troglobites derive their nourishment from nutrients washed into the cave by water.

Among the animals inhabiting the underground streams are blind cavefish, first discovered in Mammoth Cave. Ranges of two different kinds of cavefish overlap in the park.

The *Green River Valley* bisects the park from east to west. Near the west boundary, a 6-mile segment of the Nolin River forms a major tributary from the north. Both of these streams flow in incised meanders. Riverbanks are steep-sided because of alluvial deposits, and valleys are often bordered by bluffs 150-300 feet high. In places, outcroppings of limestone and sandstone produce cliffs.

The scenery is enhanced by dense forests. Sycamore, elm, and ash trees line the riverbanks, and canebrakes are common. On limestone bluffs there are mixed mesophytic forests composed of beeches, sugar maples, oaks, ashes, and yellow poplars. In the river are many forested islands. Deer, beavers, muskrats, turtles, ducks, wild turkeys, and songbirds are common. A total of 107 species of fish have been collected from the Green River, but the principal gamefish are catfish, bass, muskellunge, and carp.

valleys

cave entrance

cave passages

RIDGES, CAVES, and VALLEYS

MAMMOTH CAVE NATIONAL PARK

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One of the most scenic portions of the Green River and of great interest geologically is Turnhole Bend, a classic example of an incised meander. The bend was named because packet boats used to turn around in the discharge pool of a big spring. Several such springs drain the caves and the water enters the Green River from springs along the south bank or in the bed of the river. Hence no surface streams enter the river from the south bank east of Turnhole Bend; their former courses are represented by hanging valleys.

On the Green River, at the west boundary of the park, is Dam 6 and a navigational lock built by the Corps of Engineers in 1906 and 1907. The pool above Dam 6 extends for 17 miles on the Green River and for the entire 6-mile length of the Nolin River in the park. The remaining 9 miles of the Green River, from Mile 199 above Floating Mill Island to the east park boundary, is free flowing.

There is a reservoir on Nolin River just north of the park and another on the Green River about 100 miles upstream from the park. Even though these dams and reservoirs were built for flood control, Green River may crest at 50 feet, according to the Corps of Engineers. High water comes during periods of drawdown at the reservoirs, during seasonal runoff, and may occur suddenly because of local torrential rains.

The *Hilly Country,* the third physiographic feature of the park, is north of the Green River and west of Turnhole Bend south of the river. Here there are few caves, and those that exist are short in length and shallow in depth. No extensive cave system is possible because of the dip of the limestone; anciently the Green River served as an interceptor, as it does today for drainage from the Sinkhole Plain.

Unlike Mammoth Cave Plateau, the Hilly Country contains several surface streams. The largest and most spectacular is Nolin River. Buffalo and Ugly Creeks, and Cub Run also drain into the Green River from the north. Valleys of all of these streams are forested and contain much wildlife.

Fine views of Nolin River may be obtained from Whistle Mountain and from an overlook near Temple Hill Cemetery. Scenic points of interest in Nolin River Valley include 5-acre First Creek Lake on the floodplain and red sandstone conglomerate cliffs notable for their height and vegetative cover. These are at the mouth of Cubby Cove and Bylew Creek. Most of Bylew Creek watershed is not now in the park, but much of its vegetation is of uncommon interest because it is reminiscent of conditions that prevailed in the region of the park during the Ice Age. Eastern hemlock and butternut

trees are perhaps the most prominent of the plants comprising the relict Ice Age forest. A few of these trees grow in the park on the north flank of Indian Hill. They are much more common, however, in the Cumberland Mountains of eastern Kentucky.

Magnolia trees and mountain laurel thickets are colorful when in blossom along the Wet Prong of Buffalo Creek. Collie Ridge is clothed by a fine hardwood forest. When the forest matures, good views of the surrounding woodland and the Green River will open up from the top of Goblin Knob.

Big Woods is the only extensive stand (about 300 acres) of mature hardwoods in the park. It is probably the remnant of a virgin forest; at least it has not been logged in the memory of the oldest residents except to remove windfalls. It is probable that the forest on the Green River bluffs flanking Historic Entrance has not been logged either.

USE – HISTORICAL

Park lands are rich in cultural resources, too. Pre-Columbian Indians went into the cave passages to chip gypsum and mirabilite off the walls and ceilings, but their purpose in doing so is not clear. Chip marks, blackened ceilings from smoke of reed torches, sandals and other articles of clothing, and mummified remains of Indians have all been found in Mammoth and Salts Caves and in other cave passages in the park. Indians also occupied cave entrances and rock shelters while engaged in agriculture and hunting.

Sometime prior to September 1798, Mammoth Cave is reputed to have been discovered by a hunter named Houchens, who pursued a wounded bear into the entrance. Later, someone noted that the fine, dry cave dirt contained saltpeter and this valuable nitrate was leached from the dirt and shipped to gunpowder factories at Philadelphia from 1809 to 1819. Remains of vats and pipes may still be seen in Mammoth Cave.

In 1843 an experimental tuberculosis hospital was established in Mammoth Cave, but it was not successful. Two roofless stone cottages are still standing.

Visitors have toured the cave since 1816. Exploration was conducted and new routes were added from time to time. Exploring wild caves requires great physical stamina and uncommon courage, for tortuous passages and stygian blackness constitute an environment inhospitable to man. This has given rise to legends surrounding exploits of early guides, many of whom were Negro slaves.

As the fame of Mammoth Cave grew (it was heralded as one of the seven natural wonders of the world), overnight accommodations for visitors had to be provided. Log cabins near the Historic Entrance used by saltpeter miners were the nucleus of a hotel that became famous as the years went by. The structure burned in 1916 and was replaced in 1925. This structure was remodeled in 1930, 1936, and 1940. The new brick hotel was opened in 1965 with its associated lobby, souvenir shop, dining room, and coffee shop.

Even though Mammoth Cave was the best known, other caves had been discovered and developed for public use, including several on Flint Ridge. Some cave owners also operated their own hotels. Trails were constructed in Crystal, Great Onyx, Colossal, Proctor, and Long Caves. These and Floyd Collins' home and ticket office at Crystal Cave and some of Collins' tools are the only physical evidences remaining today of the period of private cave operation.

In early days, travelers came to Mammoth Cave by stagecoach. An 8.7-mile railroad spur was built from Glasgow Junction (now Park City) to Mammoth Cave and it operated from 1886 until 1931. Forty to fifty thousand visitors came annually.

With completion of a series of dams and locks on Green River in 1907, built by the Corps of Engineers, steamboats brought travelers to Mammoth Cave. A popular excursion trip was the 10-hour run from Bowling Green to Mammoth Cave on the river followed by a return trip by rail. The steamboat era ended in 1917. Shipping on the Green and Nolin Rivers had practically halted in 1951 when the Corps of Engineers deactivated Locks 5 and 6. Lock 6 is at the west park boundary.

Prior to establishment of the park in 1941, about 45 percent of the land area was cultivated or grazed. Tobacco and corn were principal crops. Farmlands were connected to one another and to the market by primitive wagon roads, and several private ferries crossed the Green River. Most of the farms were situated on river floodplains and on ridge tops. Soil had eroded badly in some places. Slopes of valleys and bluffs were too steep for cultivation; they remained forested and were logged. Areas formerly cultivated have returned or are returning to forest. Today, it is difficult in many places and virtually impossible elsewhere for former residents to locate places once familiar to them. Natural revegetation was assisted by plantings set out by the Civilian Conservation Corps during the period from May 1933 to July 1942 when four camps were operated in the park. The enrollees also did soil

conservation work, built roads and trails, and made improvements in the caves.

Adjacent to the park are small farms averaging 100 acres in size. Many people earn their living from growing crops, dairying, and raising livestock, but others are employed in industry (tourism and light manufacturing) and use farming to supplement their outside income. Farm populations have been declining since 1950.

USE – PRESENT DAY

Visitors proceed by private automobile or charter bus to park headquarters situated adjoining the Historic Entrance to Mammoth Cave. Here is a large parking lot and from here all cave trips originate. At park headquarters, there is a visitor center and museum, a 145-site campground, and post office. Park administrative offices are situated in a building adjoining the visitor center. National Park Concessions, Inc., provides 154 lodging units ranging from simple cottages to modern hotel rooms plus food services, and curio sales; operates a gasoline service station, a bus system to cave entrances, and a store, laundry and shower building next to the campground.

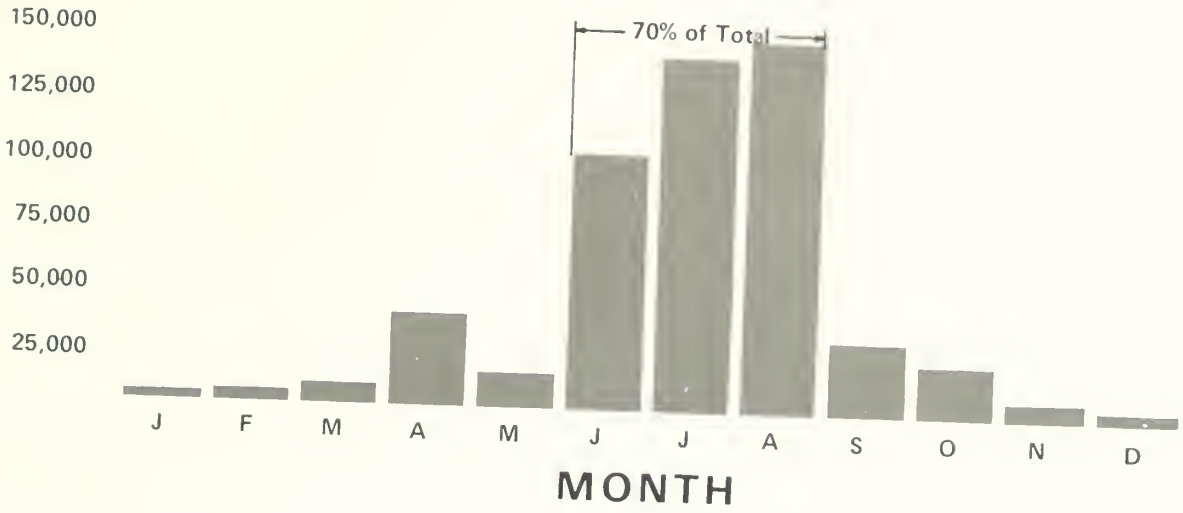
The passages of Mammoth Cave have a constant temperature of 54 degrees and visitors come all year. During the summer, a semi-self-guiding cave tour is available on which the visitor may proceed at his leisure. On this tour, the cave remains lighted, the route is clearly marked, significant features are labelled, and interpretive personnel are stationed along the route. Of the guided trips offered, the visitor can choose between a 1-1/2-hour trip, a 4-1/2-hour trip with an underground lunch stop, and a special, lantern-carrying trip of 3 hours' duration. Another popular park feature is the 1-hour sightseeing boat trip on Green River. Surface trails link all of these features and all visitor facilities are within reasonable walking distance of each other.

Green River is also used extensively by fishermen who provide their own boats and launch them at old Dennison Ferry site, at Mammoth Cave Ferry, or at Houchins Ferry. Ferries at the latter two locations are operated without fee by the National Park Service and are used mostly by local commuters.

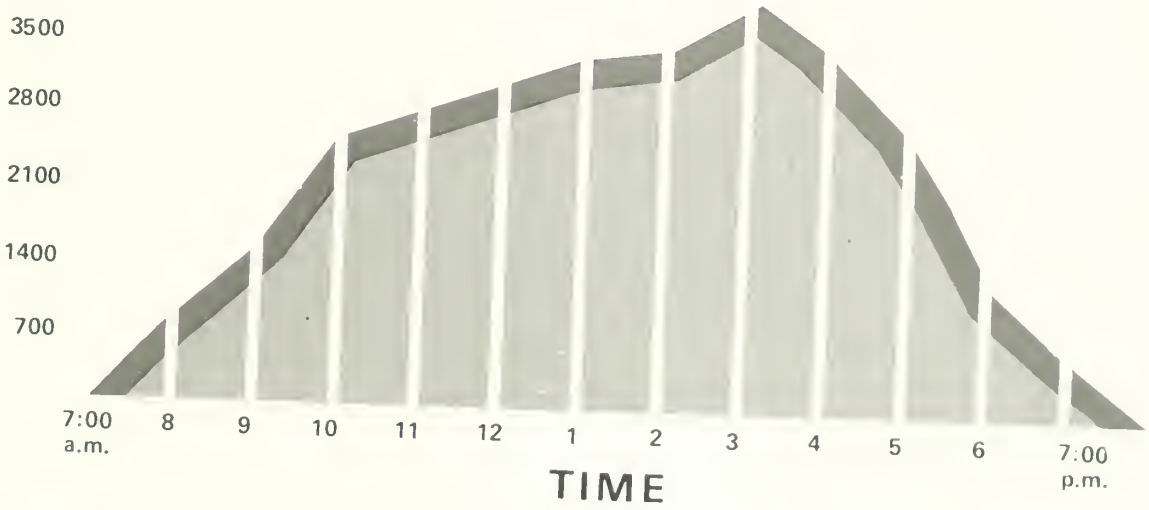
Hiking trails lead to Green River near the Historic Entrance, to First Creek Lake, Turnhole Bend, and Cedar Sink, and there is a motor nature trail on Joppa Ridge.

VISITOR PROFILE

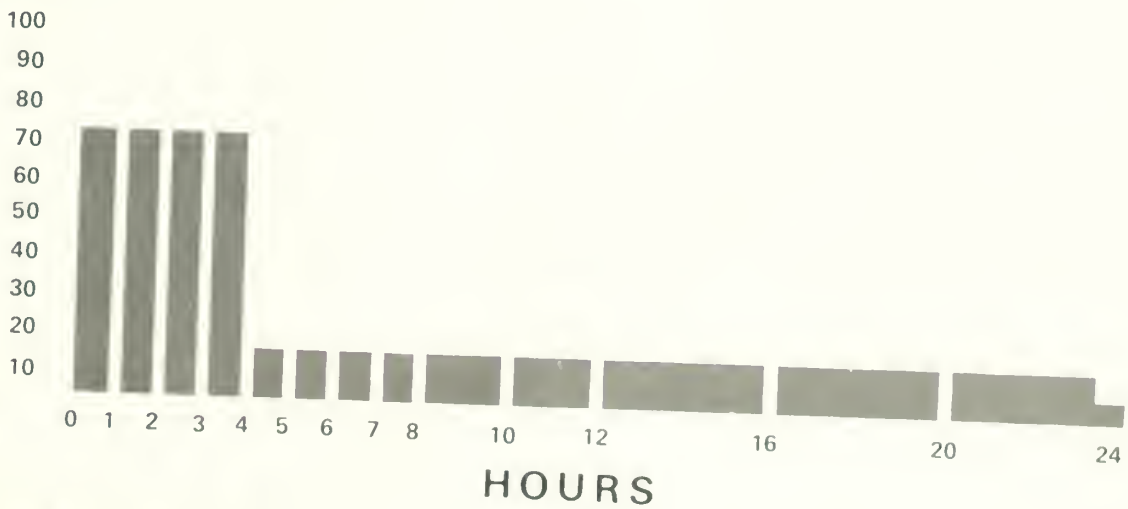
CAVE VISITS



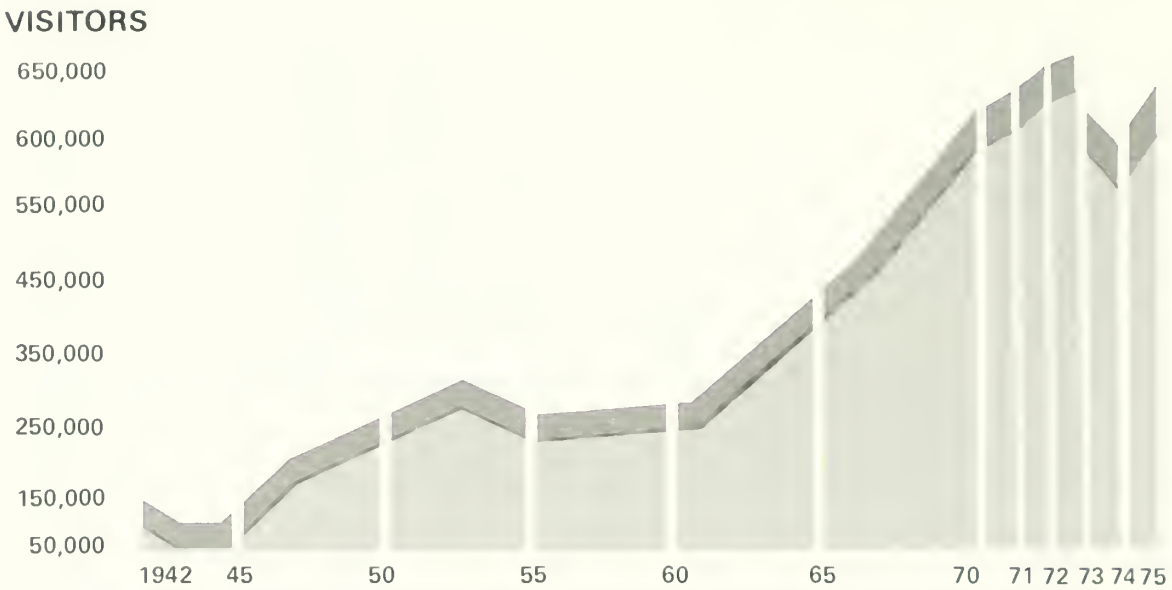
VISITORS



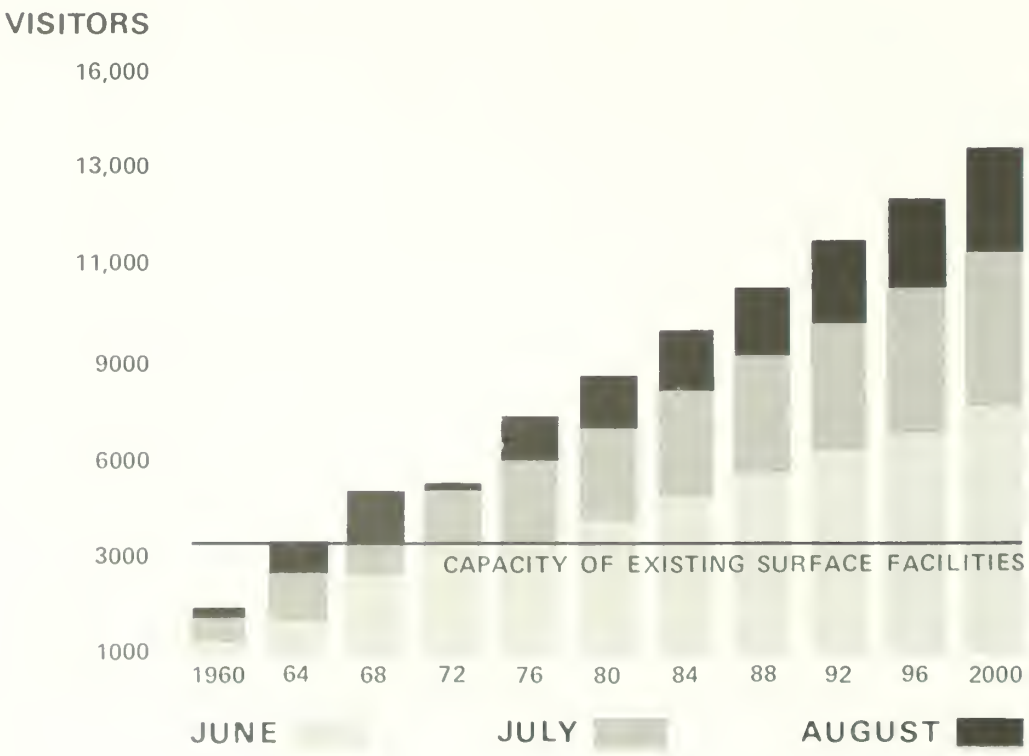
OF VISITORS



ANNUAL CAVE VISITS actual count



AVERAGE DAILY CAVE VISITATION



Scientists and explorers, under permit from the National Park Service, are conducting studies and surveys on park lands and in the cave systems.

There are three groups of park visitors: those who have only a "windshield experience" as they drive across the park on Ky 70, a park road that is a link in the state highway system (36%); those who participate in surface activities including hiking, boating, fishing, picnicking, camping, taking the sightseeing boat trip, and "people watching" (30%); and cave visitors (34%). The figures for the first two categories are estimates, but cave visitation represents actual count of ticket sales. Most persons visiting Mammoth Cave remain in the park 4 hours or less. The campground serves 17 percent of the cave visitors and it is filled to capacity each night during the summer. Of the campers, 88 percent stay one night. Lodging units accommodate 11 percent of the cave visitors, and 76 percent of these remain one night. June accounts for 15 percent, July for 26 percent, and August for 28 percent of the yearly total. These three months combined – the summer vacation period – bring nearly 70 percent of the yearly total of visitors.

Thus, in summer the number of visitors to Mammoth Cave is frequently greater than the level of facilities and services that have been provided to accommodate them. Cars overflow parking lots, the visitor center is overcrowded, and size of parties on cave trips is greater than is desirable. Use of water from springs on Flint Ridge is increasing, thus diverting more water from the caves. The possibility that polluted water may enter the park from outside is a continuing threat to park resources.

Hence, a full-scale review of park operations has been undertaken and a plan for the future has been developed. This plan appears on subsequent pages of this report.

Ruts in the sod adjacent to the visitor center at Historic Entrance caused by overflow parking when the ground is wet.

Grassed areas adjacent to the visitor center and the "Hercules" exhibit are used regularly for overflow parking.

THE PLAN FOR THE PARK

REGIONAL INFLUENCES

Being of world-wide renown, Mammoth Cave has a great impact upon the economic well-being of south-central Kentucky. Today, there are many other visitor attractions, facilities, and services in "Cave Country," which have been provided by both the public and private sector. Each is dependent on the other and it is in the common interest of all for each resource manager and business entrepreneur to assure visitors a high quality experience. Therefore, maintaining a quality environment throughout the region is essential, else all will suffer. But local planning bodies, not the National Park Service, are charged with the responsibility of determining needs and guiding development in an orderly manner. It is in this context that this plan for the park was formulated.

It is the policy of the National Park Service to cooperate fully with the Barren River Area Development District and the other local, state, and Federal agencies, and the business community. Bolstering the local economy and helping to guide compatible resource development and use are common objectives.

Historically, agriculture has been the dominant use of the land surrounding the park. It is important to the cave system in the park that this continue or that the land revert to forest, especially on the Sinkhole Plain to the south. There water disappears rapidly underground and passes through park caves to discharge into the Green River. Polluted water could destroy the rare and unique animal life in the caves and might force closing portions of the cave system as Hidden River Cave was closed several years ago.

Through the Commonwealth and county governments, Chambers of Commerce, the Mammoth Cave National Park Association, the Barren River Area Development District, and other interested groups, the National Park Service will make every effort to inform park neighbors and the public at large regarding its policies and programs and the rationale of their formulation. It is through this continuing communication with the people that the environs of the park can mature into a strong economic and well-planned unit that will be an asset to the residents and a pleasure to the visitors.

PUBLIC USE AND DEVELOPMENT

This plan reaffirms the mandate of Congress when it authorized, in 1926, establishment of Mammoth Cave National Park, and stated that the caverns, scenic river valleys, and rugged topography clothed in forests are of national significance and offer "exceptional opportunity" for outdoor recreation. Criteria for managing and using these three major park resources are spelled out in this plan, using as guidelines the management objectives cited on previous pages.

MAMMOTH CAVE PLATEAU

Visitor Congestion

Beginning in 1967, the Headquarters Area adjacent to Mammoth Cave's Historic Entrance became intolerably congested with cars and people during July and August and on peak days throughout the year. Because of this, cave trips are hurried and parties are far too large. Visitors do not receive the high quality national park experience to which they are entitled. Gone is the leisurely pace and personal greeting that used to characterize visits in former years.

It is reasonably certain that travel to the park will continue to increase. Based on the 1960 decade, there will be over 13,000 average daily cave visits in August of the year 2000, compared with 5,130 in August 1970.

The 1970 summer season of trips in Mammoth Cave, if each one was filled to capacity, could accommodate 8,005 visits during the 10-1/2-hour operational day. These trips were conducted over 6 miles of trail. An additional 3.5 miles of trail has been constructed in years past and these passages are not now being shown to the public. Therefore, by making these passages available, and scheduling to avoid overlapping, many more visitors can enter the cave each day.

Presently the largest numbers of visitors use the Historic and the Frozen Niagara Entrances with a smaller number entering the cave via the Carmichael and Violet City Entrances. New Entrance was closed in 1967 because of an unstable rock condition and it cannot be reopened. By replacing New Entrance with a short tunnel nearby into a passage near the surface, the Frozen Niagara Trip could become semi-self-guiding and would accommodate an additional 2,575 visitors per day. Thus, daily cave capacity can be increased readily by constructing new entryways (tunnel or elevator), lighting more passages, and by offering more cave trips of shorter duration to match travel trends of today. Most visitors elect the 1-hour Frozen Niagara or the 1-1/2- to 2-hour Historic Mammoth Dome Tour in preference to a 3- or 4-hour trip. Tours of short duration with fewer people per trip will make the experience more interesting and more enjoyable to each visitor.

Irrevocable physical and ecological changes have already been made in Mammoth Cave through commercialization – saltpeter mining followed by trail construction for public tours, artificial entrances, and installation of electric lighting. The additional construction outlined above will be minimally damaging in comparison.

Future tunnel and elevator entries will be provided with air locks to help maintain the cave's natural system of ventilation and humidity. Caves inhale and exhale through surface openings. At Historic Entrance, for example, dry outside air is naturally drawn inward in winter; air is expelled in summer. To maintain the constant flow of air through the cave passages, air is inhaled constantly at some openings and exhaled simultaneously from others.

Monitoring stations will be established to measure the effects of using additional passageways and increasing the daily number of visitors. Instrumental readings will be taken and analyzed regularly of air and water quality and temperature, air moisture content and evaporation rate, heat input of visitors' activities and of lighting, and associated information. Data will be secured and compared between used and unused passages. If these

WATER FLOW DIAGRAM

MAMMOTH CAVE NATIONAL PARK

1 MAMMOTH CAVE PLATEAU
2 DRIPPING SPRING ESCARPMENT
3 SINKHOLE PLAIN

CROSS SECTION

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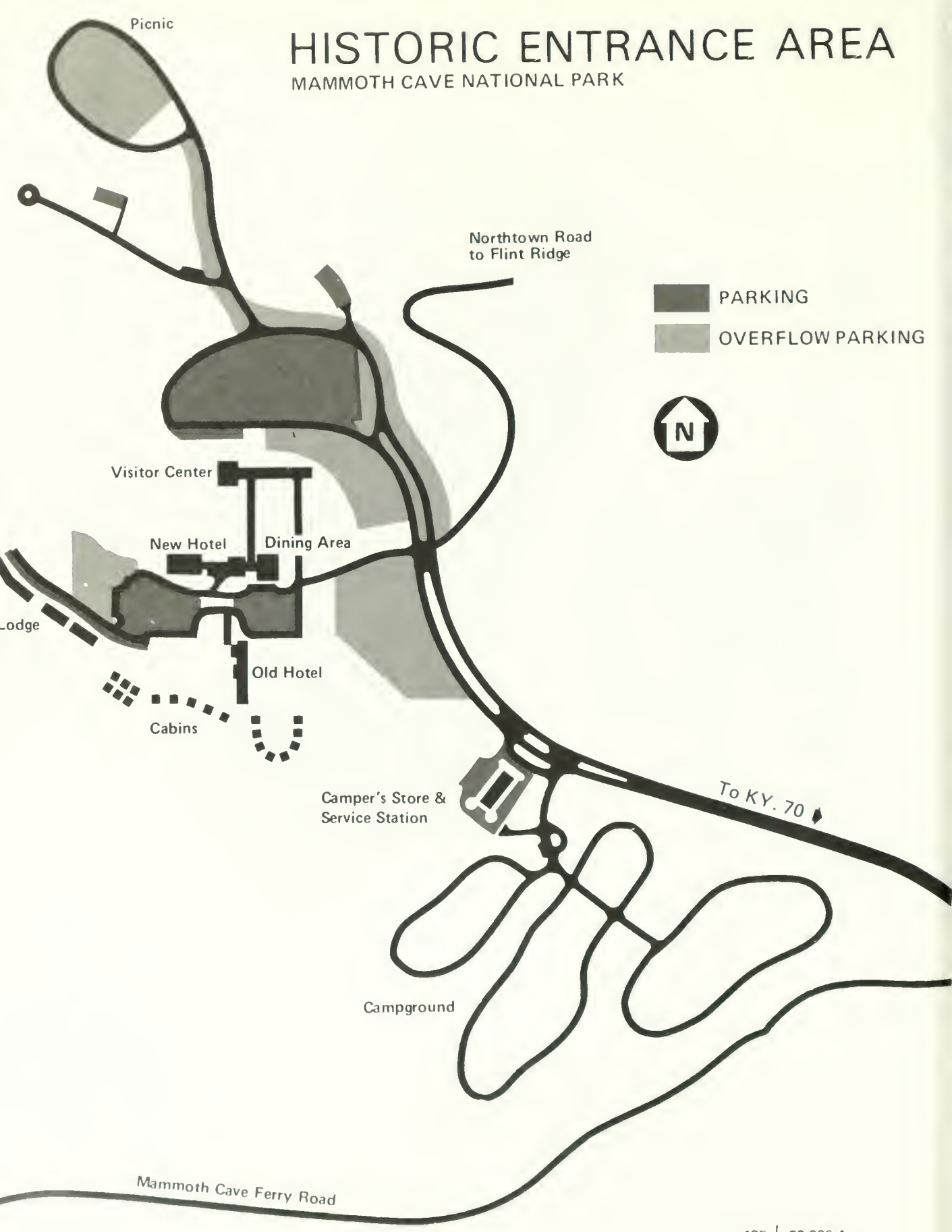
HISTORIC ENTRANCE AREA

MAMMOTH CAVE NATIONAL PARK



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readings signify that the cave environment is deteriorating, the public will be notified so that the corrective action, dictated by the circumstances, will be understood by all.

Intolerable congestion of cars and people now occurs at Park Headquarters near Historic Entrance to Mammoth Cave where all cave trips originate and where all visitor facilities are situated. To relieve this problem, the Park Service has considered many alternatives, including (1) "freeze" visitation at present levels or below, (2) expand existing facilities, and (3) relocate visitor facilities to a peripheral site.

From the foregoing discussion, it is apparent that the present and future visitor impact is too great to "freeze" visitation at the level of 3,400 cave visits per day, which is the design capacity of the surface facilities built a decade ago. Moreover, as explained above and on the basis of knowledge presently available, Mammoth Cave can accommodate at least 2-1/2 times the present number of visitors per day without harm to its appearance. Visitors will be coming to Mammoth Cave 30 years hence (by the year 2000) at this volume. It is simply unrealistic to make specific plans for longer than a 30-year period because the factors become too conjectural concerning such fundamental planning considerations as visitor interests, travel media, and new developments in the region. Therefore, the choice lies between expansion of present facilities or relocation.

Careful study of the second alternative, expansion of facilities at the Historic Entrance, leads to the conclusion that the area would be even more crowded and congested than it is now. The present parking lots would have to be replaced with a multideck garage, a structure that would dominate the Historic Entrance area. Such facilities are common to congested areas of large cities, but are out of place in national parks. Moreover, the entrance road from Chaumont, over Joppa Ridge and across Doyel Valley, to Historic Entrance would have to be widened to four lanes. More road pavement on the cave-bearing ridges would cause a greatly increased runoff of polluted water into the cave system, and considerable forest would be destroyed. Therefore, this choice is clearly not in the public interest.

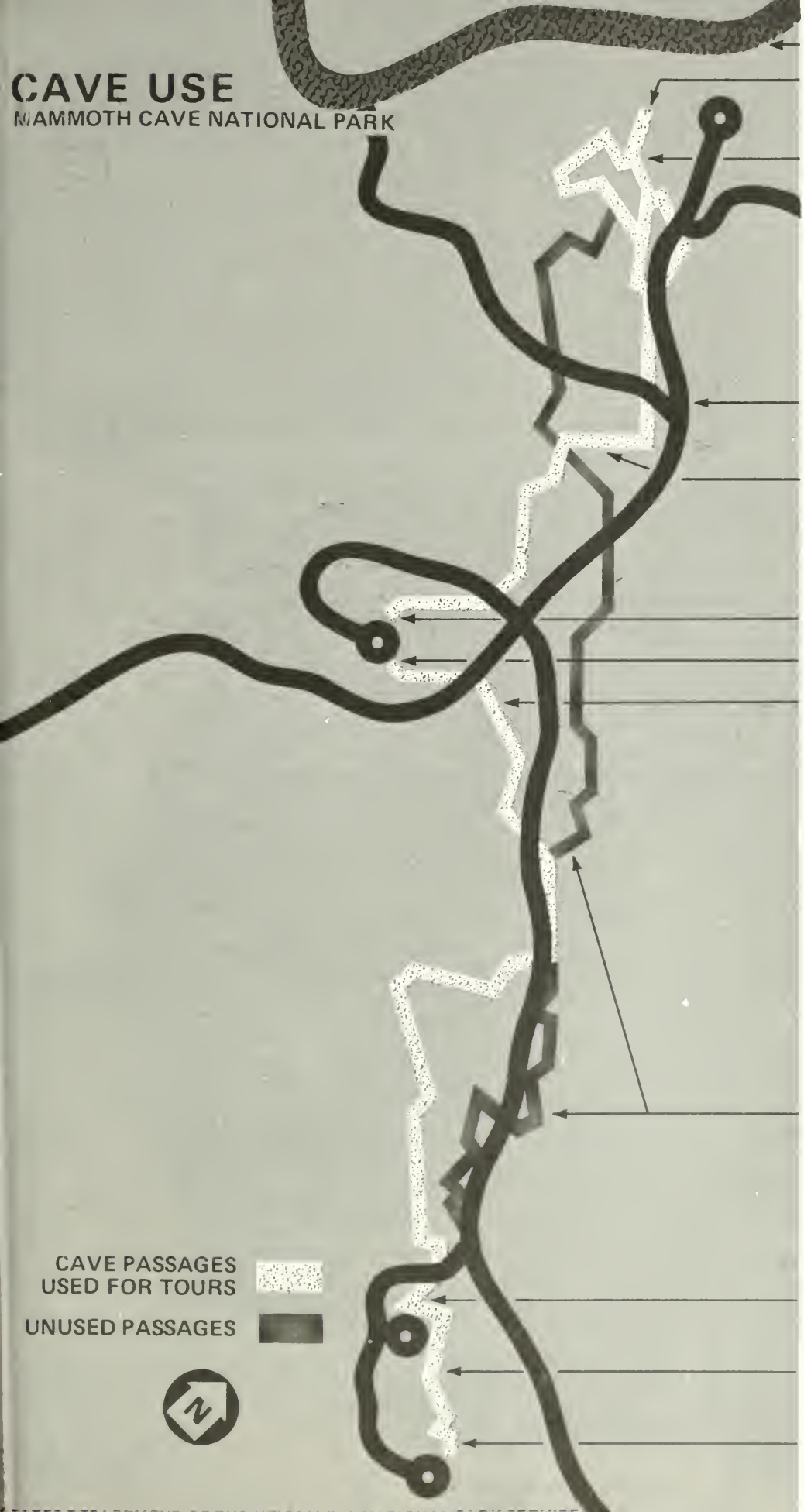
Finding a peripheral site for relocating essential visitor facilities proved difficult. It was determined that about 35 acres of level land would be needed for a staging area consisting of a parking lot and a transit terminal building. From there, visitors would be transported to various cave entrances, sightseeing boat dock, and trailheads by a transit system located on a roadbed of its own. Wherever possible, the existing intrapark circulation system roadbed would be used.

Since congestion at Historic Entrance must be relieved soon, sites were sought within the present park where the cave systems were least likely to suffer damage from construction and continued use of the staging area. Several sites were considered and the choice was narrowed down to a site on Joppa Ridge where Union City stood years ago. This site is preferred for the peripheral staging area because it is best logistically. It is closest to the main park entrance at Chaumont and is connected directly to I-65 and U.S. 31W by the Mammoth Cave Parkway (Ky 255). This road provides an enhanced entrance to the park from the Louisville-Nashville corridor, and is a limited-access, scenically controlled highway completed in 1968 by the Kentucky Department of Highways.

To accommodate increasing numbers of visitors' cars, the Park Service will widen about 3/4 mile of Ky 70 (a park road) between Chaumont and Union City. An interchange will be constructed there for traffic to enter and leave the new parking lot. Fortunately the site is underlain by Haney limestone which, at this location, has weathered to an impervious clay so that a paved parking lot will have little impact on natural percolation. Beneath the Haney is the Big Clifty sandstone, 50 to 60 feet thick. This is another impervious

Visitors standing in line at park headquarters near Historic Entrance waiting for cave-trip buses.

Proposed site for staging area. The forest has just begun to cover former farm lands.


CAVE USE
MAMMOTH CAVE NATIONAL PARK
GREEN RIVER
HISTORIC ENTRANCE
HISTORIC TOUR
SURFACE ROAD SYSTEM
VIOLET CITY TOUR
VIOLET CITY ENTRANCE
CARMICHAEL ENTRANCE
SCENIC TOUR
EXISTING UNUSED CAVE TRAILS
NEW ENTRANCE (closed)
FROZEN NIAGARA TOUR
FROZEN NIAGARA ENTRANCE
CAVE PASSAGES USED FOR TOURS
UNUSED PASSAGES
N

DEVELOPMENT CONCEPT

MAMMOTH CAVE NATIONAL PARK

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CAVE ENTRAN
---- FOOT TRAIL

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layer that protects whatever cave passages may lie beneath the site. The parking lot will be built in stages as travel increases until its ultimate size (2,320 cars) is reached.

To connect the staging area on Joppa Ridge with the existing road system on Mammoth Cave Ridge, a roadbed for transit vehicles will be built across Doyel Valley.

When the staging area has been activated, visitors will leave their cars in the parking lot and proceed to the transit terminal building. In this building there will be space for orientation/information and ticket sales. Facilities for snack-bar-type food service, craft sales and demonstrations, kennel, nursery, and a ranger station could be provided. After deciding what he wishes to do while in the park, the visitor will board a transit vehicle for an enjoyable ride en route to a cave trip, a boat ride, or a hike in the woods. All major points of interest in the southeast section of the park will be served by the transit system and park values will be preserved in the face of ever-increasing visitation.

Development of the staging area near Chaumont will require several years, but once it is operational, parking congestion at Historic Entrance will be relieved. All park visitors taking cave trips, sightseeing boat trips, or hiking trails in the southeast part of the park will be transported to the site of the activity by transit vehicle. Those motorists, however, who desire to patronize the concessioner's lodgings, food services, curio shops, and store, use the park's campground or picnic area, or transact business with the superintendent or his staff may still drive their personal vehicle to Historic Entrance. These facilities will continue to operate without expansion.

Once the structures at Historic Entrance have reached their economic life or the function they house terminates, their disposition will be governed by the public interest. However, the objective at this time is to return the Historic Entrance area to its natural appearance to the greatest extent possible.

As stated heretofore, visitor congestion in the cave and on the surface will be relieved by the plan. When cave passages have been reopened and new entries constructed, more frequent trips will be offered for parties of smaller size. Ample parking space for cars at the peripheral staging area and rapid dispersal of visitors from the transit terminal building to points of interest will eliminate present surface congestion at Historic Entrance.

Thus, this plan provides for increasing numbers of visitors to Mammoth Cave. Each visitor will have a higher quality experience than at present, the scenic values of the cave will be perpetuated, and Mammoth Cave will retain

its reputation as the outstanding tourist attraction of south-central Kentucky. Moreover, private industry in the region will enjoy new economic growth, for additional overnight accommodations, campsites and other facilities and services will be required as more and more visitors come to the park.

Intrapark Circulation

Certain roads in the park are now "open to the usual use of the public" by deed reservation. The peripheral staging area and its associated transit system will not operate effectively unless this reservation is modified. At the appropriate time, the National Park Service will petition the U.S. District Court for the Western District of Kentucky to amend the deed. When the segment of Mammoth Cave Ferry Road south of the river is closed to the public, the Joppa Ridge Motor Nature Trail will be closed also, and the Cedar Sink Motor Nature Trail substituted for it. In the 1945 deed, the Park Service was not obligated to keep either of the motor trails open to vehicular traffic.

While title to the churches and cemeteries is vested in the United States, nothing in this plan alters the privilege of members and friends of Mammoth Cave, Good Spring, Little Hope, and Joppa Churches to attend services, and the right of burial in the cemeteries to the limits thereof will continue. Persons desiring to visit cemeteries will always be able to do so.

Park Water Supply

The present supply is a mixture of the yield from springs and wells on Flint Ridge and one well on Mammoth Cave Ridge. Well water alone has a high mineral content and is not palatable. Heaviest use of water is during August, the peak travel month. At times almost the entire surface flow from the springs is diverted into the park's water-supply system and there is heavy pumping from wells.

Continued geologic and mineralogic development of the caves and the unique life forms therein all depend on water. Caves are formed when water dissolves the limestone or erodes it away, and mineral deposits in the passages are made by water. Nutrients are dissolved in water that washes organic matter into the caves from the surface. Cave life depends on these sources of food.

Currently, the park water-supply system, derived from springs and wells, reduces flow into the caves. Heaviest users of water are the Great Onyx Civilian Conservation Center, lodge visitors, campers, and park residents. When the center's activities in the park terminate, as recommended in the

PERIPHERAL SITE
MAMMOTH CAVE NATIONAL PARK

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plan, the existing water-supply system could accommodate more day-use visitors and allow more water to flow into the caves. However, future water needs will continue to increase; the Park Service will tap the Green River to assure adequate spring-water flow into the caves at all times.

Great Onyx Civilian Conservation Center (Job Corps)
At the time this facility was situated on Flint Ridge, its potential environmental effect was not fully understood. It is now apparent that the facility is a dangerous intrusion.

To sustain the flow of water from springs into the caves and to remove the potential danger of polluting the caves by sewage or leakage of gasoline and oil, it is recommended that the center be discontinued as soon as possible and the area it occupies be allowed to recover to its former natural appearance.

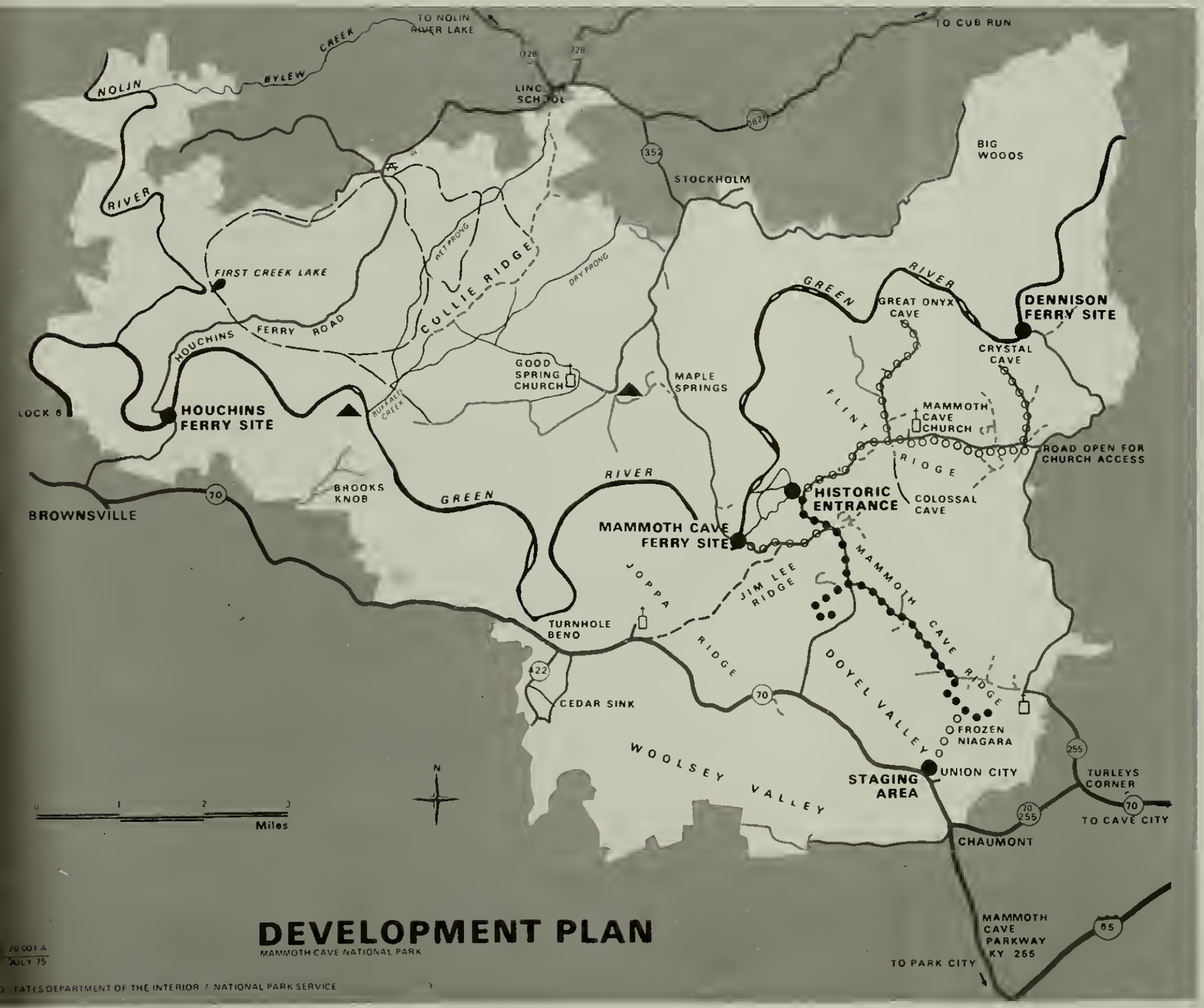
Government Facilities
When the transit terminal building at the peripheral staging area becomes operational, it will contain orientation facilities, so the museum and auditorium in the present park headquarter's building will not be needed. The space they occupy will then be converted to additional offices for the superintendent's staff. Because of the large numbers of cave trips entering or exiting at Historic Entrance, the lobby and public rest rooms will remain to serve as a transit station.

Foot trails to Green River, to Echo River and River Styx outlets, and to Sunset Point will be retained.

RIVER VALLEYS

In the River Valleys, the primitive environment may probably be observed better than in any other part of the park. Since use is now minimal, there is much opportunity for solitude and enjoyment of nature's handiwork and creatures.

The "Miss Green River," a 122-passenger motorized sightseeing boat operated by a concessioner, may continue to operate between Mammoth Cave Ferry (near Historic Entrance) and Turnhole Bend (3-1/2 miles). It provides thousands of people each year with an introduction to the outstanding scenery, the floodplain and bluff forests, and wildlife of the Green River Valley. Eventually, the transit system will transport boat passengers to and from dockside and the peripheral staging area.



DEVELOPMENT PLAN

MAMMOTH CAVE NATIONAL PARK

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SITE DEVELOPMENTS

● EXISTING ◒ PROPOSED ◑ EXPAND

HOUCHINS FERRY SITE

- ◑ PICNICKING
- ◑ BOAT LAUNCHING
- ● PRIMITIVE CAMPING
- ● FISHING
- ◑ PARKING
- ◒ INTERPRETATION
- ◒ BRIDGE

DENNISON FERRY SITE

- ◑ PRIMITIVE CAMPING
- ● BOAT LAUNCHING (hand-propelled only)
- ● FISHING

HISTORIC ENTRANCE

- ● LODGINGS, FOOD SERVICES, CURIO SALES, CAMPER'S STORE
- ● CAMPGROUND
- ● PICNIC AREA
- ◒ TRANSIT STATION
- ● TRAILS
- ◑ ADMINISTRATIVE OFFICES (NPS)

STAGING AREA

- ◒ PARKING
- ◒ ORIENTATION
- ◒ TRANSIT TERMINAL
- ◒ SNACK BAR FOOD SERVICE

MAMMOTH CAVE FERRY SITE

- ● SIGHTSEEING BOAT TRIP
- ● FISHING
- ● BOAT LAUNCHING (north bank only)
- ◑ PARKING (north bank only)
- ◒ PRIMITIVE CAMPING (north bank only)

LEGEND

	EXISTING	PROPOSED	OBLITERATE
PUBLIC ROADS	———	— —	- - - -
MANAGEMENT ROADS	———	— —	- - - -
TRANSIT SYSTEM	●●●●●	○○○○○	
TRAILS HIKING	———	— —	
PRIMITIVE CAMPING		▲	
PICNIC AREA		🚻	

Boating and fishing are the major recreational uses of the River Valleys. Fishing is mostly from small, motorized boats. To reduce noise and lessen disturbance to wildlife, only hand-propelled boats and boats driven by motors up to 10 horsepower will be permitted on the slackwaters of the park above Lock and Dam 6. Nolin River and Barren River Lakes nearby are better waterways for large boats.

On the free-flowing portion of the Green River (from Mile 199 upstream to the east park boundary), visitors seek solitude and quiet. So that its peaceful character will not be disturbed by the noise of motors, only hand-propelled craft like canoes, rowboats, johnboats, and rubber rafts may be used.

Underwater tree limbs and snags, and the murkiness of the water makes swimming hazardous in the Green and Nolin Rivers. Beaches cannot be provided because of annual flooding.

The Green River is subject to 50-foot flood crests. Hence it is not practical to construct permanent improvements on the floodplain. Moreover, the riverbanks are muddy, steep, and slippery because of the deposits of silt particularly since construction of Lock and Dam 6 at the park boundary just upstream from Brownsville.

On the south bank, at the site of the former Dennison Ferry, is a primitive campground on the floodplain. The campground will be retained along with the gravel road that serves it. No potable drinking water is available. Dennison Ferry is centrally situated relative to the 9-mile, free-flowing portion of the Green River within the park, so only hand-propelled boats may be launched there.

At Houchins Ferry, on the south bank of the river, the boat launching site will remain along with the picnic area, comfort stations, and drinking water. Similar facilities, with the possible exception of drinking water, will also be provided on the north bank. The river upstream and downstream from Houchins Ferry is envisioned as the principal water-oriented recreation area in the park. It is easily accessible by road, and adequate space on the floodplain is available for day-use development.

Primitive campsites will be established at selected points along the river for the use of those who desire to spend a day or two on the 20-mile stretch of river between old Dennison Ferry site and Houchins Ferry. Portable comfort stations will be installed. Potable drinking water will not be provided. The sites are accessible by road for servicing by park maintenance personnel.

HILLY COUNTRY

The Green River has always been a natural barrier between the easily accessible cavernous portion of the park and the more remote Hilly Country. Only two small ferries cross the Green River. Hence, the great recreational resources of the Hilly Country within the park have been largely untapped.

Therefore, this plan proposes that the two ferries be replaced by a bridge in the vicinity of the present Houchins Ferry crossing, although the final choice of bridge site will be left to further study with the aim of preserving park values to the greatest extent. The transpark roadway connecting Ky 70 and Ky 728 would be paved, designed to "lay lightly on the land," would follow closely the route of the Houchins Ferry Road, and would carry leisurely moving recreational traffic.

Recreational development of the Hilly Country will be in keeping with the preservation of the natural environment including nature enjoyment, hiking, horseback riding, and environmental education. Users of the transpark roadway will have a pleasant "windshield" experience on a leisurely trip through the woodlands where wildlife may be glimpsed. Trailhead parking areas will be provided for those desiring to hike to such places as Indian Hill, First Creek Lake, and the Wet Prong of Buffalo Creek. More extended hikes over primitive trails may be taken to such points of interest as Collie Ridge, Mouth of the Buffalo, Turnhole Bend, Goblin Knob, and Wilson Cave Hollow. At Maple Springs there is a good location for a primitive campsite to serve hikers exploring the Hilly Country north of the river.

To the north of the park, private enterprise could build motels, picnic areas, and campgrounds, for visitors to Mammoth Cave National Park and Nolin River Lake. Attractions of "Cave Country" would be easily accessible via the transpark roadway and state highways.

Once the Green River Bridge is finished and the ferries discontinued, the road from Maple Springs to the Mammoth Cave ferry site would be retained to serve a boat launching ramp on the north side of the river at the old ferry crossing. Access from the north through Stockholm would remain open to Wilkins Cemetery, and to Good Spring Church and Cemetery. Access to Little Jordan Cemetery would be from the vicinity of Bee as at present. These roads will not be upgraded and will receive minimal maintenance because of the occasional use they will receive. Minor spur roads will serve recreational developments on both banks of Green River at Houchins Ferry.

PARK MANAGEMENT

Cultural Resources

In compliance with Executive Order 11593 and prior to the decision to carry out any of the actions of this plan, all cultural resources that may be affected by the proposals will be identified and evaluated according to the National Register criteria of eligibility. The procedures of the Advisory Council on Historic Preservation (36 CFR Part 800) will then be completed, as appropriate.

Interpretation and Visitor Services

Present interpretive programs and facilities are oriented almost exclusively to the cavernous portion of the park, including the visitor center, campfire programs, signs, and literature.

Cave trips include guided and semi-self-guided types in electrically lighted passages, and guided trips in passages lighted by hand-carried lanterns. Surface trips include guided nature walks, self-guided nature hikes, and automobile tours (Joppa Ridge Motor Nature Trail). Special trips and talks are conducted for organized groups on request. An Environmental Education Center is operated for elementary and secondary school classes.

In planning for the future, those interpretive devices and activities that are appropriate will be continued and refined so as to increase the visitor's knowledge and understanding of the facts relating to the human and natural history of the park. While facts are important, the park offers unique opportunities to present a number of fundamental environmental concepts, such as the following:

biogeochemical processes that have formed and are continuing to modify features;

complex interrelationships between surface environment and cave systems;

vulnerability of cave life to alteration and perhaps extinction if the environment is changed by external agents;

great diversity and large numbers of life forms on the land compared with limited numbers of highly specialized life forms in the caves;

restoration of park lands by the healing processes of nature following decades of intensive use by man prior to the park's establishment;

value of natural ecosystems and the relict forest preserved in the park to man's knowledge of the operation of the world about him.

It is significant to note, in passing, that caves are animated by all sorts of living things rather than being sterile, and the story of their formation is a wondrous example of nature's handiwork.

The interpretive prospectus to follow this plan will provide for:

Developing interpretive material for cave guides to use on each tour.

Increasing visitor understanding of the caves by reducing the maximum party size on guided trips in lighted passages from 240 to 120. The long-range objective of the National Park Service is for maximum size of parties not to exceed 40. A trial period of evening cave trips will be inaugurated.

Improving existing lighting system.

Reopening developed passages of Great Onyx, Crystal, and Colossal Caves to provide guided, semi "wild-caving" experiences for visitors. These trips should not exceed 40 persons per party and electric lighting will not be installed. Transit vehicles will carry visitors to the entrances of Great Onyx and Crystal Caves. Colossal Cave visitors will leave the transit vehicle and walk from the roadway along a trail to be constructed to the entrance.

Seeking methods of acquainting visitors with the great variety and diversity of cave animals, both aquatic and terrestrial, and with their dependence on food washed in from the surface.

Considering interpretation on the transit vehicles once the peripheral staging area becomes operational, so that visitors en route to cave entrances, trailheads, and sightseeing boat cruises may relate the surface to underground features. This will help in understanding the close affinity between the two environments. Significant geologic and biologic objects along the transit route could be selected to illustrate these phenomena.

Planning interpretation at the Houchins and Dennison Ferry sites on the Green River. Both sites are subject to flooding. If exhibits are needed, they could be installed and removed seasonally. Topics might include the origin of the Green River as a synclinal stream, incised meanders, hanging valleys; man's manipulation of the Green and Nolin Rivers through navigational locks and dams, flood control dams, their effects on the park; vegetation of the river bluffs and the floodplains; and fish and wildlife. Houchins Ferry might remain to be operated seasonally as a historical exhibit.

Selecting appropriate sites and developing methods for interpreting such themes as the disjunct ecosystem of Bylew Creek Valley, Indian use of rock shelters, origin of Cedar Sink, First Creek Lake, and Goblin Knob, and the process of plant succession as witnessed by old field regrowth toward a climax forest condition.

Historically, the visitor has suffered a confusing and frustrating experience in locating the park because of misleading signs and inadequate information. With the recent completion of I-65 and the Mammoth Cave Parkway approach to the park, there is less confusion, but further improvement is desirable and can be effected with the cooperation of the Kentucky Department of Highways.

So that park visitors may obtain the proper orientation prior to their arrival, personnel of appropriate Kentucky and Tennessee agencies within day-use distance will be provided with complete information concerning the park and its facilities. This information will be relayed to the public in turn through folder distribution and personal contact. The Kentucky Information Centers located at rest areas on route I-65, will be kept informed for the benefit of the interstate traveler.

Once the visitor arrives in the park, it is most important that he be assisted so that he may decide what cave trips he wants to take and what other activities he wants to participate in prior to purchasing his ticket for guide service.

Because 70 percent of the visitor load now comes during July and August, an effort will be made to redistribute this by encouraging those people within day-use distance (about 2 hours) of the park, to make their visits during the more pleasant spring and fall months. This redistribution would also help balance the economic impact on the region and generate more use of the surface features during the off-season by those not bound by school vacations.

Numerous school groups now confine their park visit to cave trips. They will benefit more by using and understanding the surface features as well. For this purpose, environmental study areas have been provided.

Research

The cave systems of Mammoth Cave National Park are unique because of their length, and their abundance of animal life. Among the 200 species of animals recorded from the caves are a shrimp, a beetle, a snail, and several other invertebrates found nowhere else in the world. Some kinds of bats

congregate in the caves in winter from all over eastern United States. The surface above the caves is also one of the finest developed karstic areas in the world. Elsewhere in the park there is a disjunct ecosystem, several "basin" ecosystems, and relict tracts of forest. Hence, many of the scientific values of Mammoth Cave National Park are of world-wide significance.

Cultural values include evidences of Indian habitation on the surface and underground; saltpeter extraction; an experimental hospital for tubercular patients; and the various forms of transportation used over the years by Mammoth Cave visitors. These are all fertile themes for research.

The following research projects are needed for formulating, operating, management, and budgetary decisions, but they are not arranged in order of priority.

Continued underground exploration and mapping, together with a narrative description of features observed.

Evaluations of ecological consequences to the caves of surface and subsurface development and use.

Evaluating the necessity of continuing to make fuels available within the park and investigating means of assuring that gas and oil stores, if retained, do not leak into and contaminate the cave system.

Determining the chemistry and growth rate of minerals in cave passages.

Mapping the conduits, which carry water through the caves from the Sinkhole Plain to the Green River.

Continuing study of cave life, recording species therein, and monitoring populations of cave life.

Learning the ecology of selected "basin" ecosystems and comparing them with similar areas of the park that have been developed.

Monitoring the disjunct ecosystems of Bylew Creek, Indian Hill, and elsewhere so as to minimize, if possible, any deleterious effects that may threaten their perpetuation.

Analyzing vegetative succession.

Gathering and analyzing data on:

Volume of visitor use

Characteristics of visitor use

Visitor preferences, reaction, and motivation

Use capacity of resources

Indian use of cave minerals.

Transportation and visitor use.

Important personages and their contribution to Mammoth Cave history.

Recording personal experiences of the older guides.

Upon adoption of this plan for Mammoth Cave National Park, the Park Service will appoint a group of scientists to select and designate surface and subsurface areas and features as Research Natural Areas. Such areas, when accepted by the Federal Committee on Research Natural Areas, are listed in a directory so as to encourage their use by researchers throughout the world.

Research programs will be directed by a resident management scientist, who will also develop a research management plan for the park. Most importantly, this research management plan will provide continuity and correlation of research and management activities. The Regional Director, Southeast Region, may appoint a research board to advise the management scientist and superintendent.

Concessions and Fees

The major concessioner in the park, National Park Concessions, Inc., operates under a contract that runs until December 31, 1981. As a convenience to visitors, the concessioner provides 154 lodging units, dining for over 500 persons per hour, two small snack bars, a gasoline service station, and a camper's store. The corporation operates two shops – one with a curio emphasis and one craft shop featuring mainly products of the Southern Highlands – and offers simple food and beverage service in the cave (Snowball Dining Room) for the visitors who choose the Scenic Trip. This Scenic Trip and the Frozen Niagara Trip begin and end at points away from the Historic Entrance and, for this reason, the corporation has been providing transportation (fee) for visitors with its fleet of 8, 40-passenger and 2, 33-passenger buses. However, when the peripheral staging area becomes operational, park visitors will be transported in mass transit vehicles to all cave entrances, the sightseeing boat dock, and other points of interest

in the southeast part of the park. A combined visitor fee at the staging area will provide for the use of the transit vehicles and cave and boat trips.

The services provided by the concessioner at Historic Entrance will continue. but they will be subject to periodic review. It is congressional policy that concessioners provide only those services in the national parks that are essential to the needs of the visitor.

Any additional investment by the concessioner in fixed facilities at Historic Entrance will be limited to the present scope of facilities and Park Service maintenance standards, especially those improvements or maintenance requirements necessary to provide for the safety or health of visitors. This policy will also apply to concessioner employee quarters.

Land Classification

The Land Classification Plan drawing portrays the intensity of use and degree of preservation accorded to park lands when the development called for in this master plan has been carried out.

The application of Classes I, II, and III to park lands is obvious from table A. Special qualifications of those lands designated Class IV are explained below. No lands are designated Class V because none are, according to Park Service policy, "primitive lands that have remained pristine and undisturbed as part of our natural inheritance," nor have any lands "been restored through the healing processes of nature to a primeval state." All resources meeting the National Register criteria of eligibility will be designated as Class VI lands (historic).

The following land areas, containing objects of natural wonder and of scientific importance, belong in the Class IV category:

Big Woods: one of the best remaining examples of a white oak/black oak/tuliptree forest (upper slopes) and beech/maple forest (lower slopes) in eastern North America (about 300 acres).

"Basin" ecosystems: watersheds (basins), 150 feet or more in depth, comprise natural ecosystems useful for scientific observation and study. These must not contain developments such as roads, trails, campsites, or buildings, and each must be surrounded by a buffer area. The buffer may contain trails and primitive campsites. A typical example of a "basin" ecosystem is the north branch of Wilson Cave Hollow. The proximity of this area to Big Woods suggests the need to protect all of the northeast section of the park for its paramount scientific values. Such natural ecosystems,

comprising an entire watershed, are rare and study of them is important to management of Mammoth Cave National Park and to the International Biological Program. In Mammoth Cave National Park, 22 "basin" ecosystems have been located and delineated on the Land Classification Plan. As mentioned above, a committee will study and select the most significant of these; the others will revert to the class adjacent to them.

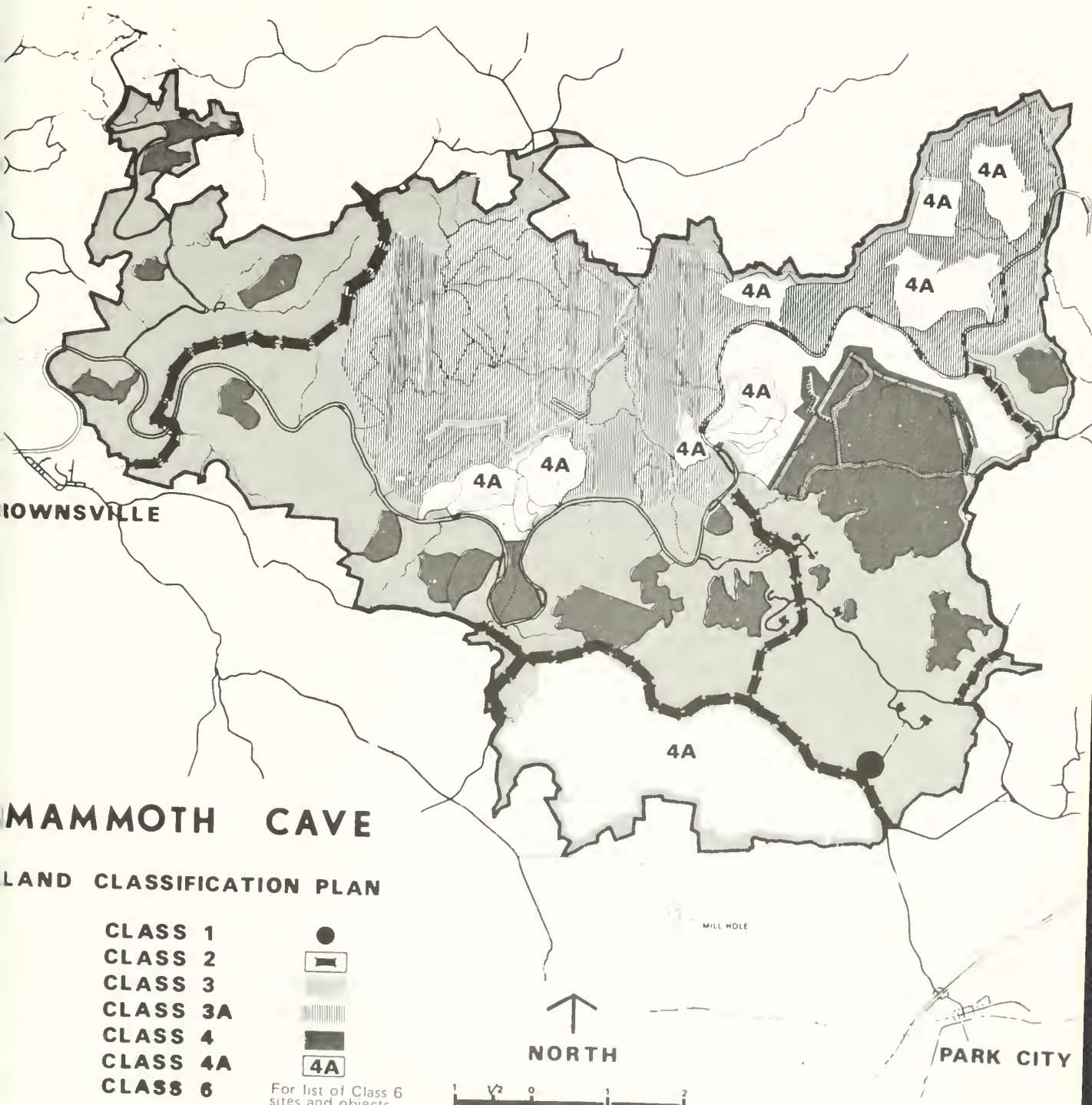
Bylew Creek Valley: certain plants that grow here typify this area as a "disjunct mixed mesophytic community." The area around the mouth of Bylew Creek Valley is endowed with a climate that is favorable to the growth of more northerly plants. This disjunct ecosystem is an "island" of vegetation that has survived from a past glacial period. The key tree species in this community is the hemlock *(Tsuga canadensis)*. It, and its associates, will continue to grow here so long as climatic and site conditions remain stable. Although there are two or three other such plant communities elsewhere in the park, including one on the north slope of Indian Hill, none is more than 10 acres in extent. While this plant community is rare in Mammoth Cave National Park, it is more common in the Cumberland Mountains 100 miles to the east.

Virgin Forest: in the vicinity of Historic Entrance, Cave Island, and the River Styx outlet. This forest has not been logged, so far as is known, and its composition is representative of the mixed mesophytic forest growing on lower slopes of limestone bluffs along the Green River.

Goblin Knob: an erosional remnant to the north of the Green River.

Turnhole Bend: a classic example of an incised meander and the most noteworthy feature of the Green River in the park. Turnhole Spring, at the Bend, is the most spectacular resurgence of an underground stream in the park.

Woolsey Valley: one of the finest examples of solution valley physiography known anywhere. Woolsey Valley and its tributary valleys (uvalas) were formed through the coalescence of many sinkholes. At the west end of the valley is Cedar Sink, a "window" providing a view of a segment of an underground stream. Tributary to Cedar Sink are several cave passages useful for studying cave formation at or near the water table. At the east end of the valley is Long Cave, largest and most important bat hibernaculum in the park for it shelters a colony of the Indiana bat *(Myotis sodalis)*, whose numbers have been dropping seriously in recent years. This bat is on the Secretary of the Interior's list of endangered species. Woolsey Valley was farmed intensively before the park was established.



MAMMOTH CAVE

LAND CLASSIFICATION PLAN

CLASS 1
CLASS 2
CLASS 3
CLASS 3A
CLASS 4
CLASS 4A
CLASS 6

4A

For list of Class 6 sites and objects see page 34

PARK BOUNDARY

TED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE

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Strawberry Valley: a small solution valley of scientific interest and high scenic quality at the south end of Flint Ridge.

Double Cellars Sink and Hunts Sink: especially good examples of sinkholes.

Deer Park Hollow: a hanging valley formed as the Green River lowered its bed faster than the tributary, whose waters were pirated by sinkholes.

Ridge Tops on Mammoth Cave Plateau: portions of Flint, Joppa, and Jim Lee Ridges overlay significant cave resources. On Flint Ridge, however, there are roads serving cave entrances, the church and cemeteries. There are also overhead powerlines that provide electricity for lighting Mammoth Cave and pumping water. These must remain and they have been placed in Class III corridors 50 feet wide.

By Class IV designation on Flint Ridge, the National Park Service recognizes the great worth of the underlying cave system for research. Concomitantly the Park Service obligates itself to seek the cooperation of the Department of Labor in discontinuing the Great Onyx Civilian Conservation Center (Job Corps) activities, at an early date, followed by removal of structures and restoration of the area to its natural condition.

On the Land Classification Plan drawing extensive areas of the park have been designated Class IIIA and Class IVA. These lands will be managed much as they have been in the past 30 years so that the "healing processes of nature" will be unhindered by man's activity. In time, the farmsteads, wagon roads, fence lines, and other works of man will disappear. When this condition exists, these wildlands might then meet the criteria established by Congress for inclusion in the National Wilderness Preservation System established by Public Law 88-577.

The following Class VI (historic and cultural) sites and objects have been identified to date: Mammoth Cave Railroad train consisting of the dummy-type locomotive "Hercules" and one coach designed as a combination baggage/passenger car, saltpeter vats and two tubercular huts within Mammoth Cave, archaeological resources in Salts Cave, Floyd Collins' home, Crystal Cave ticket office, and the Old Hotel. These are in the process of nomination to the National Register of Historic Places. Other sites of historic, cultural, or archaeological value are being studied for possible nomination. The national register nominations mentioned above are not shown on the accompanying land classification plan because they are too small for the scale of the drawing.

Table A: Land Classification System

Class	Definition	Use
I	High-density recreation area	Peripheral staging area.
II	General outdoor recreation area	Two-way public roads, minor developed areas, and Park Headquarters.
III	Natural environment area	Motor tour routes, trails, campsites, and the like.
IV	Outstanding natural area	Lands of special scientific value.
V	Primitive	No lands so designated in Mammoth Cave National Park.
VI	Historic and cultural area	Use variable consistent with preservation of site, structure, or object.

Cave Zones

The National Park Service is concerned with the management and use of all the cave passages within the park. Therefore, it is appropriate to establish guidelines similar to the Land Classification System described above.

Under the Cave Zoning System (table B) proposed in this plan, zones are designated by the letters "A" through "E" in descending order of intensity of use and development. No passages in Flint Ridge or Joppa Ridge are zoned "A" or "B" and spelunker traffic is limited to zones "C" and "D". All passages not now discovered are zoned "E" automatically.

Cave Zone A is limited to those areas where people assemble, such as the Snowball Dining Room, Grand Central Station, Mt. McKinley comfort station, and elevator portals. Such places, essential to the comfort and convenience of the visitor, are situated in sections of cave passages that have low aesthetic and/or scientific value.

Cave Zone B includes those cave passages provided with electric lighting aesthetically arranged and developed with trails, bridges, steps, stairways, and handrails. Guides accompany all parties and a fee is charged. Parties not exceeding 120 persons with two guides may be conducted over the trails in passages so developed. Depending on the width of the passages and fragility of formations, up to 650 persons per hour may be admitted to Zone B on

semi-guided tours. Party size mentioned above is maximum; visitors will generally have a higher quality experience when numbers are smaller.

Those passages that are partially developed or were once developed and are now abandoned are in Zone C. Trails range from good to somewhat primitive, other development is limited to that essential for visitor safety, and there is no electric lighting. Such passages provide a "wild-cave" experience for visitors without training in caving techniques. Lighting is by hand-carried lanterns. Tour size, with at least one guide, is limited to 25 to 40 persons, depending on the passages traversed, and there is a fee for the services of the guide.

Natural passages are classified in Zone D. Only those experienced in caving techniques and properly equipped may traverse these passages, which have not been improved in any way except for possibly remedying dangerous situations. Parties must be small and a special fee is charged for guided tours.

Those portions of the cave systems reserved for scientific study and approved for exploration, or pristine passages that would be irreparably damaged by heavy use are in Zone E. Temporary "E" zoning may also be obtained for non "E" passages by scientists conducting approved projects.

Cave systems containing unique natural and historic features are in Zone F. They may be located within Zones B through E. Special measures may be taken to ensure their protection and preservation, as warranted, and this may include highly restricted visitation such as to a bat colony at certain seasons of the year.

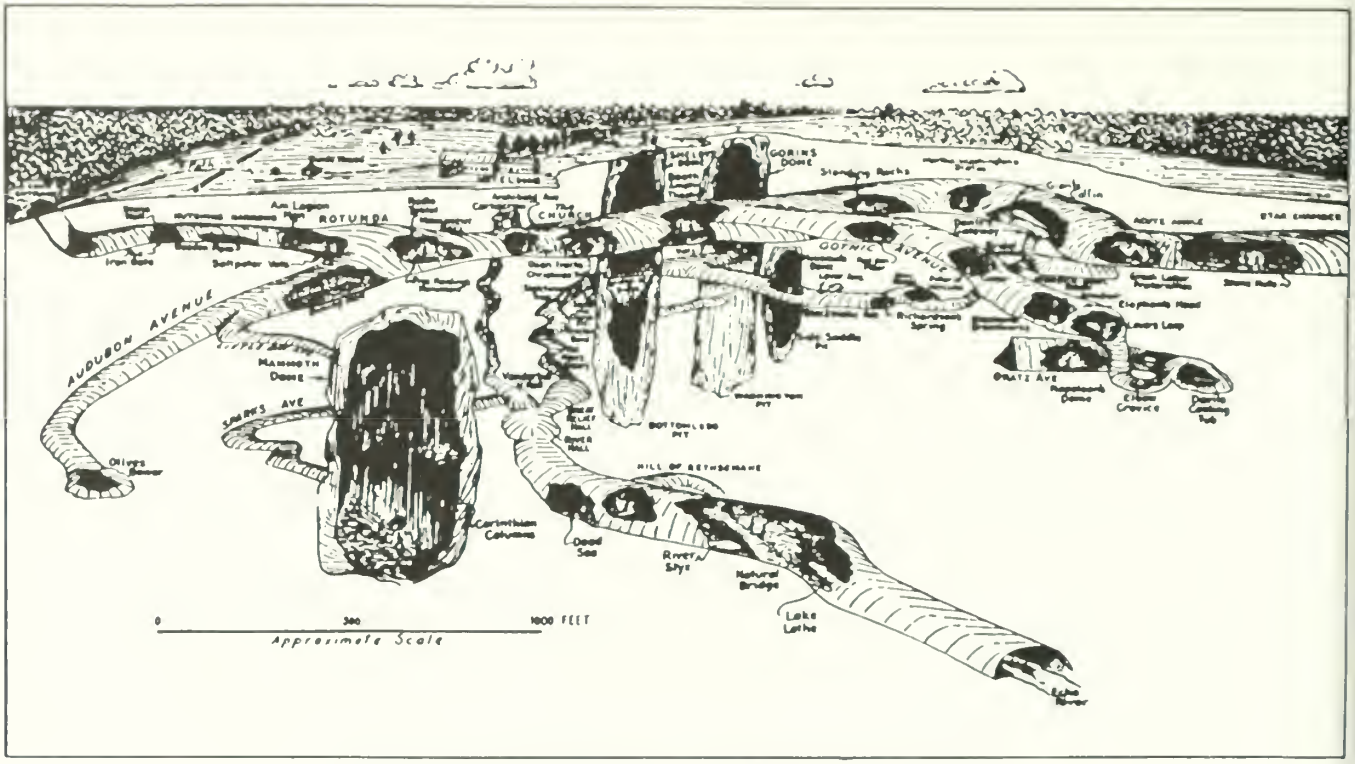
At the request of the Park Service, the Cave Research Foundation made an independent study of the problem of zoning cave passages and published its findings in *Wilderness Resources in Mammoth Cave National Park: A Regional Approach (1971).* A committee will be appointed by the Regional Director to assist the park superintendent to devise a workable system.

It is impractical to compress into the pages of this report drawings to represent the lengthy honeycomb pattern of passages in the cave systems, hence there are none to illustrate either Cave Zoning System. Such drawings will become a part of the Resources Management Plan soon to be prepared. After the Cave Zoning System has been completed and implemented, consideration will be given to reassessing portions of the caves for wilderness designation, particularly those portions zoned C through F.

Nothing in the zoning system to be developed will reduce the authority of the superintendent to regulate entry into and use of the cave passages; it is a guide that identifies for him the maximum degree of use permissible for the preservation of the underground features. Park regulations may be modified by the Cave Zoning System upon its completion.

Table B: Cave Zoning System

Zone	Definition	Examples
A	Intensive use area	Snowball Dining Room; rest area
B	Fully developed passage; electrically lighted	Cleaveland Avenue, Broadway, etc.
C	Partially developed passage; no electric lighting	Nickerson Avenue, Fox Avenue, old commercial routes in Colossal, Crystal, Great Onyx, and Proctor Caves, back part of Salts Cave
D	Natural passage	Blue Spring Branch, Marion Avenue, Columbian Avenue, Pohl Avenue, front part of Salts Cave
E	Scientific study or pristine passage	Paradise passage in New Discovery, parts (or perhaps all) of Upper Turner Avenue, White Cave, Long Cave in winter
F	Outstanding natural or historic feature or passage	Saltpeter vats and pipes, unique column in Upper Turner Avenue, Attic Room



Diagrammatic Representation of Mammoth Cave, Ky.

Showing different "levels" of the cave that follow the horizontal bedding planes of the rock; and "domes" that follow the vertical joints.

APPENDIX

BASIC DATA

Establishment of The Park

The movement towards creating a national park of Mammoth Cave and its vicinity started in 1905 when this was suggested by members of the Kentucky congressional delegation to the Secretary of the Interior. Subsequently, bills were introduced in Congress, but no action was taken until after the Secretary of the Interior received the report of the Southern Appalachian National Park Commission on April 18, 1926.

In its report to the Secretary, the commission recommended national park status for the Mammoth Cave region of Kentucky because of:

The limestone caverns that contain "beautiful and wonderful formations," the "great underground labyrinth" of passageways "of remarkable geological and recreational interest perhaps unparalleled elsewhere," and the "thousands of curious sinkholes of varying sizes through which much of the drainage is carried to underground streams, there being few surface brooks or creeks";

The rugged topography and "areas of apparently original forests which, though comparatively small in extent, are of prime value from an ecological and scientific standpoint, and should be preserved for all time in its virgin state for study and enjoyment";

The "beautiful and navigable Green River and its branch, the Nolin River," which flow through the forests of the area; and

"All of this offers exceptional opportunity for developing a great national recreational park of outstanding service in the very heart of our Nation's densest population and at a time when the need is increasingly urgent and most inadequately provided for."

Pursuant to the recommendation of the Southern Appalachian National Park Commission and the endorsement of the citizens of Kentucky, the Congress

of the United States authorized, on May 25, 1926 (44 Stat. 635), the establishment of Mammoth Cave National Park, to contain 70,618 acres. The act stipulated that only donated lands conveyed in fee simple could be accepted by the Secretary of the Interior. Later, Congress appropriated Federal funds to speed land acquisition.

For the purpose of receiving donations of land and money, the Mammoth Cave National Park Association was organized in Bowling Green in October 1924 and it was incorporated on July 16, 1925. This group had no power of condemnation, so upon its recommendation the Kentucky Legislature created the Kentucky National Park Commission in 1930. This legislature also appropriated funds to be used for land acquisition.

The association and the commission each operated the cave properties it had acquired. By agreement with these groups the National Park Service began, after May 1934, the condemnation and purchase of property, and Mammoth Cave was operated by a joint committee with the profits earmarked for land acquisition. By May 22, 1936, 27,402 acres of land had been acquired and accepted by the Secretary of the Interior. The area was declared a national park on July 1, 1941, when the minimum of 45,310 acres (over 600 parcels) had been assembled; much of it was infertile farmland. Subsequently, the Great Onyx Cave and Crystal Cave properties were purchased and added to the park on April 7, 1961. The park now comprises 51,354.40 acres of the 70,618 acres authorized.

Legal Provisions

Kentucky ceded exclusive jurisdiction over park lands by an act of its legislature in 1930 and this was accepted by the Secretary of the Interior on May 1, 1944, by authority of the act of June 5, 1942 (56 Stat. 317). Exclusive jurisdiction over the remainder of the land was accepted on May 1, 1965. By these cessions the Secretary is empowered to make rules and regulations for the proper management and care of the park and for the protection of the property therein including the fish and wildlife.

By deed reservation, certain roads are to remain open for the usual use of the public. These roads were recorded in Deed No. 262, dated June 18, 1945, filed in Edmonson County Deed Book 45, pp. 604-607.

With respect to the cemeteries at Little Hope Church, Mammoth Cave Church, and Little Jordan United Baptist Church, title to the lands was conveyed in fee simple to the United States subject to the right of ingress and egress to these cemeteries and the right of burial in these cemeteries, not to exceed the burial capacities thereof at the time of acquisition, to members

of the churches and their families. As a matter of policy, these rights have been extended to all cemeteries in the park. Other cemetery reservations affecting park lands are: the Jaggers Cemetery (1 acre), the Holton Cemetery (2 acres), and on the former Crystal Cave property, ¼ acre for a graveyard, a space within the cave forever reserved as the permanent resting place of Floyd Collins, and a monument and a lot 10 feet square outside the cave.

The United States owns the cave rights only beneath a 2.99-acre tract of land along the park boundary southeast of Little Hope Church.

On February 28, 1929, the Kentucky Utilities Company was granted a 50-foot powerline easement and access for construction and maintenance across the Great Onyx and Crystal Cave properties.

Laws and a Secretarial order affecting the management of Mammoth Cave National Park follow.

Mammoth Cave National Park

An Act To provide for the securing of lands in the southern Appalachian Mountains and in the Mammoth Cave regions of Kentucky for perpetual preservation as national parks, approved February 21, 1925 (43 Stat. 958)

National Parks Determination of areas to be acquired for Shenandoah, Va., and Smoky Mountains, Tenn. and N.C.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is hereby authorized and directed to determine the boundaries and area of such portion of the Blue Ridge Mountains of Virginia lying east of the South Fork of the Shenandoah River and between Front Royal on the north and Waynesboro on the south as may be recommended by him to be acquired and administered as a national park, to be known as the Shenandoah National Park, and such portion of the Smoky Mountains lying in Tennessee and North Carolina as may be recommended by him to be acquired and administered as a national park, to be known as the Smoky Mountains National Park, and in the Mammoth Cave regions of Kentucky and also such other lands in the southern Appalachian Mountains as in his judgment should be acquired and administered as national parks, and to receive definite offers of donations of lands and moneys, and to secure such options as in his judgment may be considered reasonable and just for the purchase of lands within said boundaries, and to report to Congress thereon: *Provided*, That the Secretary of the Interior may, for the purpose of carrying out the provisions of this Act, appoint a commission of five members, composed of a representative of the Interior Department and four national park experts, said four members to serve without compensation. (U.S.C., 6th supp., title 16, sec. 403c.)

Lands in Mammoth Cave regions of Kentucky, etc.

Securing options, etc.

Proviso. Commission to be appointed. (Referred to in sec. 4, vol. 44, p. 635. See p. 189.)

Amount authorized for expenses.

SEC. 2. A sum sufficient to secure options and to pay the necessary expenses of the commission in carrying out the provisions of this Act, including the salary of one clerk to the commission at a rate not to exceed $2,000 per annum, necessary traveling expenses of the members of the commission, and $10 per diem in lieu of actual cost of subsistence, in all, not to exceed $20,000 is hereby authorized to be appropriated.

An Act To provide for the establishment of the Mammoth Cave National Park in the State of Kentucky, and for other purposes, approved May 25, 1926 (44 Stat. 635)

National Park, Mammoth Cave, Ky., set apart for, when lands therefor vested in United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That when title to lands within the area hereinafter referred to shall have been vested in the United States in fee simple, there shall be, and there is hereby, established, dedicated, and set apart as a public park for the benefit and enjoyment of the people, the tract of land in the Mammoth Cave region in the State of Kentucky, being approximately seventy thousand six hundred and eighteen acres, recommended as a National Park by the Southern Appalachian National Park Commission to the Secretary of the Interior, in its report of April 8, 1926, and made under authority of the Act of February 21, 1925; which area, or any part or parts thereof as may be accepted on behalf of the United States in accordance with the provisions hereof, shall be known as the Mammoth Cave National Park: *Provided*, That the United States shall not purchase by appropriation of public moneys any land within the aforesaid area, but such lands shall be secured by the United States only by public or private donation. (U.S.C., 6th supp., title 16, sec. 404.)

Description. Vol. 43, p. 958. See p. 287.

Proviso. Lands to be secured only by donation.

SEC. 2. The Secretary of the Interior is hereby authorized, in his discretion, to accept, as hereinafter provided, on behalf of the United States, title to the lands referred to in the previous section hereof, and to be purchased with the funds which may be subscribed by or through the Mammoth Cave National Park Association of Kentucky, and with other contributions for the purchase of lands in the Mammoth Cave National Park area: *Provided*, That any of said lands may be donated directly to the United States and conveyed to it, cost free, by fee-simple title, in cases where such donations may be made without the necessity of purchase. (U.S.C., 6th supp., title 16, sec. 404a.)

Acceptance of title to lands conveyed, authorized.

Proviso. Direct conveyance accepted.

SEC. 3. The administration, protection, and development of the aforesaid park shall be exercised under the direction of the Secretary of the Interior by the National Park Service, subject to the provisions of the Act of August 25, 1916, entitled "An Act to establish a National Park Service, and for other purposes," as amended: *Provided*, That the provisions of the Act approved June 10, 1920, known as the Federal Water Power Act, shall not apply to this park: *And provided further*, That the minimum area to be administered and protected by the Na-

National Park Service to administer, etc.

Vol. 39, p. 535. See p. 9.

Provisos. Water Power Act not applicable.

Vol. 41, p. 1063. Minimum area specified.

tional Park Service shall be, for the said Mammoth Cave National Park, twenty thousand acres, including all of the caves: *Provided further*, That no general development of said area shall be undertaken until a major portion of the remainder in such area shall have been accepted by said Secretary. (U.S.C., 6th supp., title 16, sec. 404b.)

Area to be accepted before any development made.

SEC. 4. The Secretary of the Interior may, for the purpose of carrying out the provisions of this Act, employ the commission authorized by the Act approved February 21, 1925. (U.S.C., 6th supp., title 16, sec. 404c.)

Commission employed.

Vol. 43, p. 959. See p. 288.

Mammoth Cave National Park

Jurisdiction, State cession over park land....State Act of March 22, 1930
Amend Act of May 25, 1926, relating to establishment of park.....
.....Act of May 14, 1934
Addition to park of lands acquired with allocated funds, authorization to exclude Great Onyx and Crystal Caves.....Act of August 28, 1937
Jurisdiction, State cession of 1930 accepted, land acquisition fund, entrance road.....Act of June 5, 1942

Excerpt from An Act ceding to the United States exclusive jurisdiction over the Mammoth Cave National Park in the State of Kentucky, approved March 22, 1930 (Acts of 1930, ch. 132, p. 405; Carroll's Kentucky Statutes, sec. 3766e-17)

SEC. 2. That the exclusive jurisdiction shall be, and the same is, hereby ceded to the United States over, within, and under all the territory in the State of Kentucky, thus to be, and as, deeded or conveyed to, or acquired by, the United States; saving and reserving, however, to the State of Kentucky the right to serve civil and criminal process, issued under its authority, within the limits of the land or lands thus deeded or conveyed to, or acquired, by the United States, in suits or prosecutions for, or on account of, rights acquired, obligations incurred, or crimes committed in said State outside of said land or lands; and on account of rights acquired, obligations incurred, or crimes committed on, or within, said land or lands, prior to the date of the giving or service of notice as hereinafter provided, of the assumption of police jurisdiction over such land or lands by the United States; and further saving and reserving to the said State the right to tax sales of gasoline and other motor conveyance fuels, and oils for use in motor conveyances, except to the extent that such gasoline and other fuels and oils may be used by the United States Government and its agents in the administration, protection, improvement, maintenance, development, and operation of the said land or lands deeded or conveyed as aforesaid; and, also, further saving and reserving to the said State of Kentucky the right to tax persons, firms, and corporations, their franchises and properties, on the said land or lands, deeded or conveyed as aforesaid; and saving and reserving, also, to persons residing in or on any of the land or lands deeded or conveyed as aforesaid, the right to vote at all elections within the respective counties of their residence, upon like terms and conditions, and to the same extent, as they would be entitled to vote in

such counties had not such land or lands been deeded or conveyed, as aforesaid, to the United States; *Provided, however,* that such jurisdiction shall not invest in the United States unless, until, and as, the United States, through the Secretary of the Interior, notifies the Governor of the State of Kentucky, and through him the said State, that the said United States assumes police jurisdiction over the land or lands thus deeded or conveyed.

An Act To amend the Act of May 25, 1926, entitled "An Act to provide for the establishment of the Mammoth Cave National Park in the State of Kentucky, and for other purposes," approved May 14, 1934 (48 Stat. 775)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the second and third provisos of section 3 of the Act of May 25, 1926, entitled "An Act to provide for the establishment of the Mammoth Cave National Park in the State of Kentucky, and for other purposes" be, and the same are hereby, amended to read as follows: *"And provided further,* That the minimum area to be administered and protected by the National Park Service shall be, for the said Mammoth Cave National Park, twenty thousand acres: *Provided further,* That no general development of said area shall be undertaken until a major portion of the remainder in such area, including all the caves thereof, shall have been accepted by said Secretary, and he shall have established a schedule of fees for admission to such caves." (16 U.S.C. sec. 404b.)

Mammoth Cave National Park, Ky. 44 Stat. 636. amended.

Minimum area.

Development contingent upon acceptance.

Schedule of admission fees.

SEC. 2. That in the establishment of the said Mammoth Cave National Park the Secretary of the Interior is hereby authorized to accept donations of money for the acquisition of lands and rights therein and to acquire the same by purchase, condemnation, or otherwise. (16 U.S.C. sec. 404c.)

Acquisition of lands.

An Act To make available for national-park purposes certain lands within the area of the proposed Mammoth Cave National Park, Kentucky, approved August 28, 1937 (50 Stat. 871)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That all lands purchased from funds heretofore allocated and made available by Executive order, or otherwise, for the acquisition of lands for conservation or forestation purposes within the maximum boundaries of the Mammoth Cave National Park as authorized by the Act of May 25, 1926 (44 Stat. 635), be, and the same are hereby, made a part of the said park as fully as if originally acquired for that purpose and the proviso at the end of section 1 of said Act of May 25, 1926, shall not be construed so as to prohibit the acquisition of lands in said area under funds made available as aforesaid. (16 U.S.C. sec. 404f.)

Mammoth Cave National Park, Ky. Certain lands added.

44 Stat. 635. 16 U.S.C. sec. 404.

Acquisition other than by donation.

Exclusion of certain caves authorized.

SEC. 2. The Secretary of the Interior is hereby authorized, in his discretion, to exclude the Great Onyx Cave and the Crystal Cave, or either of them, from the maximum boundaries of the said park, and the area required for general development of the said park by section 1 of the Act of May 14, 1934 (48 Stat. 775), is hereby modified accordingly. (16 U.S.C. sec. 404b-1.)

48 Stat. 775. 16 U.S.C. sec. 404b.

An Act To accept the cession by the Commonwealth of Kentucky of exclusive jurisdiction over the lands embraced within the Mammoth Cave National Park; to authorize the acquisition of additional lands for the park in accordance with the Act of May 25, 1926 (44 Stat. 635); to authorize the acceptance of donations of land for the development of a proper entrance road to the park; and for other purposes, approved June 5, 1942 (56 Stat. 317)

Mammoth Cave National Park, Ky.

Acceptance of cession of exclusive jurisdiction.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the provisions of the act of the General Assembly of the Commonwealth of Kentucky, approved March 22, 1930 (Acts of 1930, ch. 132, p. 405), ceding to the United States exclusive jurisdiction over, within, and under such territory in the Commonwealth as may be acquired for the Mammoth Cave National Park, are hereby accepted. Subject to the reservations made by the Commonwealth in the act of cession, the United States hereby assumes sole and exclusive jurisdiction over such territory. (16 U.S.C. sec. 404c-1.)

Assignment to Kentucky western judicial district.

SEC. 2. The park shall constitute a part of the United States judicial district for the western district of Kentucky, and the district court of the United States in and for said district shall have jurisdiction over all offenses committed within the boundaries of the park. All fugitives from justice taking refuge in the park shall be subject to the same laws as fugitives from justice found in the Commonwealth of Kentucky. (16 U.S.C. sec. 404c-2.)

Fugitives from justice.

Hunting and fishing restrictions.

SEC. 3. All hunting or the killing, wounding, or capturing at any time of any wild bird or animal, except dangerous animals when it is necessary to prevent them from destroying human lives or inflicting personal injury, is prohibited within the limits of the park, nor shall any fish be taken out of any of the waters of the park, except at such seasons and at such times and in such manner as may be directed by the Secretary of the Interior. The Secretary of the Interior shall make and publish such general rules and regulations as he may deem necessary and proper for the management and care of the park and for the protection of the property therein, especially for the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonderful objects within the park, and for the protection of the animals and birds in the park from capture or destruction, and to prevent their being frightened or driven from the park; and he shall make rules and regulations governing the taking of fish from the waters in the park. Possession within the park of the dead bodies or any part thereof of any wild bird or animal shall be prima facie evidence that

Rules and regulations.

Evidence of violation.

Persons violating provisions of Act, etc.

the person or persons having the same are guilty of violating this Act. Any person or persons, stage or express company, railway or other transportation company, who knows or has reason to believe that such wild birds, fish, or animals were taken or killed contrary to the provisions of this Act or the rules and regulations promulgated by the Secretary of the Interior, and who receives for transportation the dead bodies or any part thereof of the wild birds, fish, or animals so taken or killed, or who shall violate any of the other provisions of this Act, or the rules and regulations, with reference to the management and care of the park, or for the protection of the property therein, for the preservation from injury or spoliation of timber, mineral deposits, natural curiosities, or wonderful objects within the park, or for the protection of the animals, birds, and fish in the park, or who shall within the park commit any damage, injury, or spoliation to or upon any building, fence, sign, hedge, gate, guidepost, tree, wood, underwood, timber, garden, crops, vegetables, plants, land, springs, mineral deposits, natural curiosities, or other matter or thing growing or being thereon, or situated therein, shall be deemed guilty of a misdemeanor and shall be subject to a fine of not more than $500 or imprisonment not exceeding six months, or both, and be adjudged to pay all the costs of the proceedings. (16 U.S.C. sec. 404c-3.)

Penalty.

Forfeiture of property used for unlawful purposes.

SEC. 4. All guns, traps, nets, seines, fishing tackle, teams, horses, or means of transportation of every nature or description used by any person or persons within the limits of the park when engaged in killing, trapping, ensnaring, taking, or capturing such wild birds, fish, or animals contrary to the provisions of this Act or the rules and regulations promulgated by the Secretary of the Interior shall be forfeited to the United States and may be seized by the officers in the park and held pending prosecution of any person or persons arrested under the charge of violating the provisions of this Act, and upon conviction under this Act of such person or persons using said guns, traps, nets, seines, fishing tackle, teams, horses, or other means of transportation, such forfeiture shall be adjudicated as a penalty in addition to the other punishment prescribed in this Act. Such forfeited property shall be disposed of and accounted for by and under the authority of the Secretary of the Interior: *Provided,* That the forfeiture of teams, horses, or other means of transportation shall be in the discretion of the court. (16 U.S.C. sec. 404c-4.)

Proviso.

Park commissioner. Appointment and jurisdiction.

SEC. 5. Upon the recommendation and approval of the Secretary of the Interior of a qualified candidate, the United States District Court for the Western District of Kentucky shall appoint a park commissioner, who shall have jurisdiction to hear and act upon all complaints made of any violations of law or of the rules and regulations made by the Secretary of the Interior for the government of the park and for the protection of the animals, birds, and fish, and objects of interest therein, and for other purposes authorized by this Act. Such commissioner shall have power, upon sworn information, to issue process in the name of

Judicial powers.

the United States for the arrest of any person charged with a violation of the rules and regulations, or with a violation of any of the provisions of this Act prescribed for the government of the park and for the protection of the animals, birds, and fish in the park, and to try the person so charged, and, if found guilty, to impose punishment and to adjudge the forfeiture prescribed. In all cases of conviction an appeal shall lie from the judgment of the commissioner to the United States District Court for the Western District of Kentucky; and the district court shall prescribe the rules and procedure and practice for the commissioner in the trial of cases and for appeal to the district court. (16 U.S.C. sec. 404c-5.)

Appeals.

Rules and procedure and practice.

Jurisdiction over other offenses.

SEC. 6. The park commissioner shall also have power to issue process, as hereinbefore provided, for the arrest of any person charged with the commission within the park of any criminal offense not covered by the provisions of section 3 of this Act, to hear the evidence introduced, and, if he is of the opinion that probable cause is shown for holding the person so charged, for trial, shall cause such person to be safely conveyed to a secure place of confinement within the jurisdiction of the United States District Court for the Western District of Kentucky, and certify a transcript of the record of his proceedings and the testimony in such case to the said district court, which court shall have jurisdiction of the case. The park commissioner shall have authority to grant bail in all cases according to the laws of the United States. (16 U.S.C. sec. 404c-6.)

Bail.

Pay of commissioner

SEC. 7. The park commissioner shall be paid an annual salary as appropriated for by Congress. (16 U.S.C. sec. 404c-7.)

Fees, costs, and expenses.

SEC. 8. All fees, costs, and expenses arising in cases under this Act and properly chargeable to the United States shall be certified, approved, and paid as are like fees, costs, and expenses in the courts of the United States. (16 U.S.C. sec. 404c-8.)

Deposits.

SEC. 9. All fees, fines, costs, and expenses imposed and collected shall be deposited by the commissioner, or by the marshal of the United States collecting the same, with the clerk of the United States District Court for the Western District of Kentucky. (16 U.S.C. sec. 404c-9.)

Notice of passage of Act.

SEC. 10. The Secretary of the Interior shall notify in writing the Governor of the Commonwealth of Kentucky of the passage and approval of this Act, and of the fact that the United States assumes police jurisdiction over the park. Upon the acceptance by the Secretary of the Interior of further cessions of jurisdiction over lands now or hereafter included in the Mammoth Cave National Park, the provisions of sections 2 to 9, inclusive, shall apply to such lands. (16 U.S.C. sec 404c-10.)

Acquisition of additional property.

SEC. 11. The Secretary of the Interior is hereby authorized in his discretion to acquire for inclusion within the Mammoth Cave National Park by purchase, condemnation, or otherwise, any lands, interests in lands, and other property within the maximum boundaries thereof as authorized by the Act of May 25, 1926 (44 Stat. 635), notwithstanding

16 U.S.C. secs. 404-404c, 404f.

the provisions of the Act of August 28, 1937 (50 Stat. 871), or any action taken thereunder to exclude certain caves from the park area.

Special fund from excess of revenues over appropriations.

For the purpose of enabling the Secretary of the Interior to acquire property on behalf of the United States, as authorized by this section, there shall be reserved and set aside in the Treasury a special fund of not to exceed $350,000. Said fund shall consist of the annual revenues of the Federal Government from the Mammoth Cave National Park which are in excess of the annual appropriations made for the administration, protection, and maintenance of said park. At the close of each fiscal year, the Secretary of the Interior shall certify to the Secretary of the Treasury the excess of revenues over appropriations for the preceding fiscal year.

Title to acquired property.

The title to lands, interests in lands, and other property to be acquired pursuant to this Act shall be satisfactory to the Secretary of the Interior. Any property acquired pursuant to this Act upon acquisition by the Federal Government, shall become a part of the park, and shall be subject to all laws and regulations applicable thereto. (16 U.S.C. sec. 404c-11.)

Development of entrance road.

SEC. 12. For the purpose of developing a proper and suitable entrance road to the Mammoth Cave National Park, the Secretary of the Interior is hereby authorized in his discretion to accept on behalf of the United States donations of lands, buildings, structures, and other property or interests therein, or to acquire such property with donated funds by purchase, condemnation, or otherwise, within an area or areas to be determined by him, but (a) not to exceed one mile in width, extending from the exterior boundary of the Mammoth Cave National Park to a point to be selected by him on United States Highway Numbered 31-W, and (b) not to exceed one-half mile in width on either side of United States Highway Numbered 31-W and running for a distance of not to exceed two miles along said highway. Lands acquired for purposes of protecting such entrance roads shall not be less than five hundred feet in width on either side of said roads: *Provided*, That only one such entrance road shall be established between United States Highway Numbered 31-W and Mammoth Cave National Park pursuant to this Act. (16 U.S.C. sec. 404c-12.)

Acceptance of donations.

Proviso.

Mammoth Cave National Park

Excluding the Great Onyx and the Crystal Cave from maximum boundaries of the park: Order of Dec. 3, 1940[1] .....

ORDER EXCLUDING THE GREAT ONYX CAVE AND THE CRYSTAL CAVE FROM THE MAXIMUM BOUNDARIES OF THE MAMMOTH CAVE NATIONAL PARK, KENTUCKY

[Dec. 3, 1940—5 F. R. 5071]

Pursuant to the authority contained in section 2 of the act of Congress approved August 28, 1937 (50 Stat. 871), I, Harold L. Ickes, Secretary of the Interior, do hereby exclude the Great Onyx Cave and the Crystal Cave from the maximum boundaries of the Mammoth Cave National Park as authorized by the Act of May 25, 1926 (44 Stat. 635), and the area required for general development of the said park by section 1 of the act of May 14, 1934 (48 Stat. 775), is modified accordingly.

IN WITNESS WHEREOF I have hereunto set my hand and caused the official seal of the Department of the Interior to be affixed in the City of Washington, this 3d day of December 1940.

HAROLD L. ICKES,
Secretary of the Interior.

[SEAL]

[1] Sec. 11, act of June 5, 1942 (56 Stat. 317) authorized acquisition of property within maximum boundary as authorized by act of May 25, 1926 (44 Stat. 635), notwithstanding this order. See Vol. II, p. 74.

Mammoth Cave National Park

Commissioner to be appointed solely by the United States District Court.....Act of April 21, 1948
Amendment of section 11 of Act of June 5, 1942, and appropriation of $350,000 authorized for acquisition of lands.....Act of June 30, 1948
Authorization for Secretary of the Interior to cooperate with the State of Kentucky to acquire non-Federal cave properties within the park.....Act of March 27, 1954

An Act To provide that appointments of United States commissioners for the Isle Royale, Hawaii, Mammoth Cave, and Olympic National Parks shall be made by the United States district courts without the recommendation and approval of the Secretary of the Interior, approved April 21, 1948 (62 Stat. 196)

U.S. commissioners. Appointments to certain national parks. 56 Stat. 184.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the first sentence of section 5 of the Act entitled "An Act to accept the cession by the State of Michigan of exclusive jurisdiction over the lands embraced within the Isle Royale National Park, and for other purposes", approved March 6, 1942 (U.S.C., 1940 edition, Supp. V, title 16, sec. 408m), is amended by striking out "upon the recommendation and approval of the Secretary of the Interior of a qualified candidate."

SEC. 2. The first paragraph of section 6 of the Act entitled "An Act to provide for the exercise of sole and exclusive jurisdiction by the United States over the Hawaii National Park in the Territory of Hawaii, and for other purposes", approved April 19, 1930, as amended (U.S.C., 1940 edition, title 16, sec. 395e), is amended by striking out "upon the recommendation and approval of the Secretary of the Interior of a qualified candidate".

46 Stat. 228.

SEC. 3. The first sentence of section 5 of the Act entitled "An Act to accept the cession by the Commonwealth of Kentucky of exclusive jurisdiction over the lands embraced within the Mammoth Cave National Park; to authorize the acquisition of additional lands for the park in accordance with the Act of May 25, 1926 (44 Stat. 635); to authorize the acceptance of donations of

land for the development of a proper entrance road to the park; and for other purposes", approved June 5, 1942 (U.S.C., 1940 edition, Supp. V, title 16, sec. 404c-5), is amended by striking out "Upon the recommendation and approval of the Secretary of the Interior of a qualified candidate, the" and inserting in lieu thereof "The".

56 Stat. 318.

SEC. 4. The first sentence of section 5 of the Act entitled "An Act to accept the cession by the State of Washington of exclusive jurisdiction over the lands embraced within the Olympic National Park, and for other purposes", approved March 6, 1942 (U.S.C., 1940 edition, Supp. V, title 16, sec. 256d), is amended by striking out "Upon the recommendation and approval of the Secretary of the Interior of a qualified candidate, the" and inserting in lieu thereof "The". (See 28 U.S.C. § 631 note.)

56 Stat. 137.

An Act To amend section 11 of the Act approved June 5, 1942 (56 Stat. 317), relating to Mammoth Cave National Park in the State of Kentucky, and for other purposes, approved June 30, 1948 (62 Stat. 1165)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the second paragraph of section 11 of the Act approved June 5, 1942 (56 Stat. 317, 319; 16 U.S.C. sec. 404c–11), is hereby amended to read as follows:

Mammoth Cave National Park, Ky.

"In order to provide for acquisition of property on behalf of the United States, in accordance with the provisions of this section, there is hereby authorized to be appropriated the sum of not to exceed $350,000. Any of the funds appropriated pursuant to the provisions hereof which are not needed to acquire property as authorized by this section may, in the discretion of the Secretary of the Interior, be used to acquire lands and interests in lands required for the development of a proper and suitable entrance road to Mammoth Cave National Park, as authorized in section 12 of this Act. The funds heretofore deposited in the Treasury under special fund receipt account 146664 shall, upon the passage of this Act, be transferred to the general fund of the Treasury as miscellaneous receipts: *Provided*, That no part of this authorization shall be used for road development or construction until after all the lands within the maximum boundaries, as authorized by the Act of May 25, 1926 (44 Stat. 635), have been acquired by purchase, condemnation or otherwise." (16 U.S.C. § 404c–11.)

Appropriation authorized.

Acquisition of lands.

56 Stat. 320.

Restriction.

16 U.S.C. §§ 404–404c.

An Act To authorize the Secretary of the Interior to cooperate with the State of Kentucky to acquire non-Federal cave properties within the authorized boundaries of Mammoth Cave National Park in the State of Kentucky, and for other purposes, approved March 27, 1954 (68 Stat. 36)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress as-

sembled, That the Secretary of the Interior is authorized to cooperate with the State of Kentucky for the purpose of arranging for the eventual acquisition by the United States of the Great Onyx Cave and the Crystal Cave within the authorized boundaries of Mammoth Cave National Park. The Secretary shall deposit to the credit of a special receipt account that portion of the annual admission, guide, and elevator fee receipts from the said park which exceeds the annual amount available to the park for management, guide, and protection purposes, which funds so deposited may be expended thereafter in payment for the purchase of said cave properties. The Secretary is further authorized to enter into such contracts and agreements as he may determine to be necessary to effectuate the acquistion of the cave properties as authorized herein. (16 U.S.C. § 404b–2.)

Kentucky. U.S. authority to acquire cave properties.

The following cooperative agreements are now in effect:

for preventing and controlling forest fires, made December 12, 1962, with the Kentucky Division of Forestry.

for wildlife management, made August 12, 1958, with the Kentucky Department of Fish and Wildlife Resources.

for wildlife cooperation, a memorandum of understanding made April 3, 1970, with the Kentucky Department of Fish and Wildlife Resources.

for cave research, a memorandum of agreement first made October 20, 1959, with the Cave Research Foundation and "reviewed annually."

BIBLIOGRAPHY

Books

Barr, Thomas C., Jr. "The Blind Beetles of Mammoth Cave, Kentucky," The American Midland Naturalist, Vol. 68, 1962, No. 2, pp. 278-284.

. "Ecological Studies in the Mammoth Cave System of Kentucky I: The Biota," International Journal of Speleology, Vol. III, 1967, pp. 147-204, Plates 37-64.

. "Cave Ecology and the Evolution of Troglobites," Evolutionary Biology, Vol. II, 1968, pp. 35-102, 24 figs.

. "Cave Carabidae (Coleoptera) of Mammoth Cave," Psyche, Vol. 73, pp. 284-287, and Vol. 74, pp. 24-26, 1966-1967.

Braun, E. Lucy. *Deciduous Forests of Eastern North America.* pp. 146-150, 155, 1950. Hafner Publishing Company, facs. 1967, New York.

Bridwell, Margaret, M. *The Story of Mammoth Cave National Park, Kentucky: A Brief History.* 5th Ed. 1966, 64 pp., 17 figs., privately printed.

Brown, Richmond F. *Hydrology of the Cavernous Limestones of the Mammoth Cave Area, Kentucky.* Geological Survey Water-Supply Paper 1837, 1966, 64 pp., 24 figs., 4 tables.

Brucker, Roger W. "Truncated Cave Passages and Terminal Breakdown in the Central Kentucky Karst," National Speleological Society Bulletin, 1966, Vol. 28, No. 4, pp. 171-178, 7 figs.

Cushman, R. V.; Krieger, R. A.; and McCabe, John A. *Present and Future Water Supply for Mammoth Cave National Park, Kentucky.* Geological Survey Water-Supply Paper 1475-Q, 1965, pp. 601-647, Figs. 71-81, 9 tables.

Davidson, Joseph K. and Bishop, William P. *Wilderness Resources in Mammoth Cave National Park: A Regional Approach.* A Cave Research Foundation Study, 1971, 34 pp., 7 figs., 2 tables.

Delecour, F.; Weissen, F.; and Eik, C. "An Electrolytic Field Device for the Titration of CO_2 in Air," National Speleological Society Bulletin, Vol. 30, No. 4, 1968, pp. 131-136, 8 figs.

Livesay, Ann. *Geology of the Mammoth Cave National Park Area,* Special Publication 7, Kentucky Geological Survey, 1962, 40 pp., 17 figs., 9 plates.

Mohr, Charles E. and Paulson, Thomas L. *The Life of the Cave.* McGraw-Hill, Inc., 1966, 232 pp., profusely illustrated.

Paulson, Thomas L. and White, William B. "The Cave Environment," Science, 1969, Vol. 165. pp. 971-981, 3 figs.

Schmidt, Victor A. "Problems of Cave Conservation in the U.S.A.," Studies in Speleology, Vol. 1, parts 2-3, 1965, pp. 82-88, 3 plates.

Schwartz, Douglas W. *Prehistoric Man in Mammoth Cave.* Publ. by Eastern National Park and Monument Association, 1965, 24 pp., profusely illustrated.

Smith, Philip M. "Regional Economic Development and Wilderness at Mammoth Cave," News and Notes, Vol. III, Nos. 1 and 2, Cumberland Chapter, Sierra Club.

Watson, Patty Jo. "Prehistoric Miners of Salts Cave, Kentucky," Archeology, Vol. 19, No. 4, 1966, pp. 237-243, 2 figs., 10 plates.

Watson, R. A. "Central Kentucky Karst Hydrology," National Speleological Society Bulletin, Vol. 28, No. 3, 1966, pp. 159-166.

White, William B.; Watson, Richard A.; Pohl, E. R.; and Brucker, Roger. "The Central Kentucky Karst," Geographical Review, Vol. 60, 1970, pp. 88-115, 12 figs.

Wilson, Gordon. *Folkways of the Mammoth Cave Region,* 1962, 64 pp., 17 figs., privately printed.

. *Birds and Their Habitats in Mammoth Cave National Park.* Publ. by Eastern National Park and Monument Association, 1968, 39 pp., 6 figs., 3 tables.

Periodical

"Kentucky Travel Guide – Welcome to Kentucky." Published periodically by Editorial Services Company, 445 Baxter Avenue, Louisville, Kentucky 40204.

Reports

"A Wilderness Proposal for Mammoth Cave National Park, Kentucky," 20 pp., 2 maps, 1967, prepared by the National Speleological Society, 609 Meadow Lane, Vienna, Virginia 22180.

"A Wilderness Plan for Mammoth Cave National Park and the Surrounding Region," 13 pp., 3 plates, 1967, prepared by William J. Hart and Walter S. Boardman for the National Parks Association, 1300 New Hampshire Avenue, N.W., Washington, D.C. 20036.

"The Preservation of Wilderness Karst in Central Kentucky, U.S.A.," 13 pp., 1 map, 1967, Richard A. Watson, The Cave Research Foundation, Washington, D.C.

The Year 2000: A Long Range Plan, 90 pp., 1970, illustrated, prepared by the Department of Geography and Geology, Western Kentucky University in cooperation with the Barren River Area Development District, Inc., P. O. Box 154, Bowling Green, Kentucky 42101.

"Travel Survey in Kentucky 1966," by Dr. Lewis C. Copeland, Department of Economics, University of Tennessee, prepared for the Department of Public Information, Commonwealth of Kentucky.

"Travel Survey of Kentucky's 12 Red-Carpet Vacation Regions, 1966: Region IV, Cave Country," Copeland, ibid.

Wilderness and Recreation – A Report on Resources, Values and Problems, Appendix B, "Cave Resources." pp. 322-324, ORRRC Study Report 3, 1962.

"The Flint Ridge Cave System, Mammoth Cave National Park, Kentucky – A Cave Research Foundation Cartographic Project in cooperation with the National Park Service," First Edition 1964, 3 pp., 3 figs., 31 plates.

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Staff

The following members of the professional staff of the National Park Service, assisted Mr. Chick in developing the concepts in this master plan, writing the report, and preparing the graphics:

John G. Parsons, Landscape Architect
John M. Spurgeon, Concessions Planner
John F. Weiler, Civil Engineer

* Dr. Barr prefers a Mammoth Cave Ridge site for peripheral development of additional facilities to meet the increased visitation, with retention of existing facilities (without further expansion) in the vicinity of the Historic Entrance. He believes that peripheral development in the Frozen Niagara area would be (a) far less destructive of park resources and (b) far less costly in terms of required congressional appropriation of public funds. He feels that the Big Woods area, Woolsey Valley, and extensive portions of the Flint Ridge cave system meet the criteria for wilderness designation, and that the natural flow of water from all of the springs on Flint Ridge should be restored at the earliest possible opportunity.

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* Commonwealth officials were consulted in July, 1968

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, parks and recreation areas, and to ensure the wise use of all these resources. The Department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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